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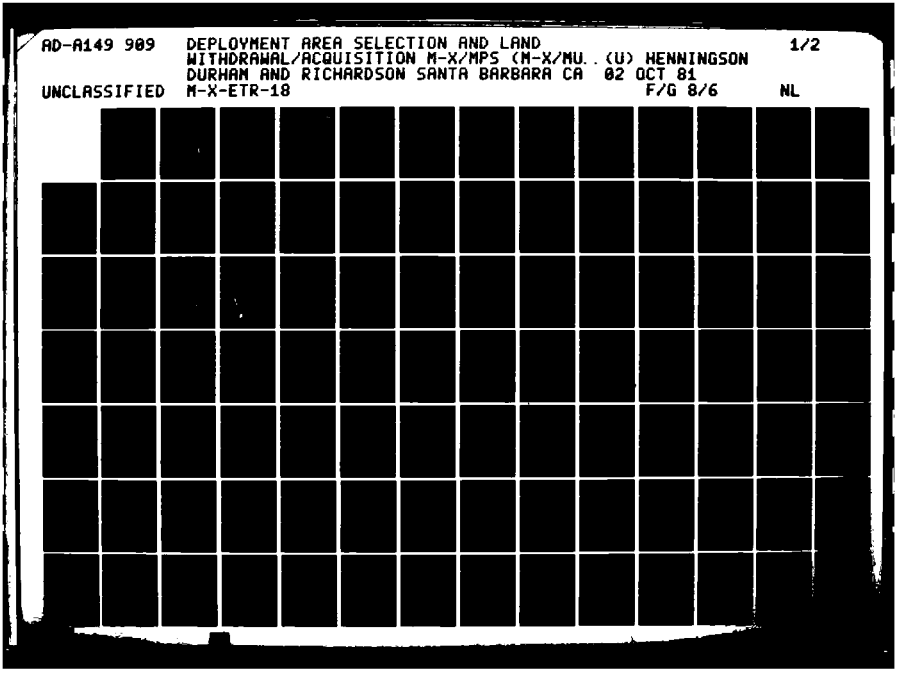

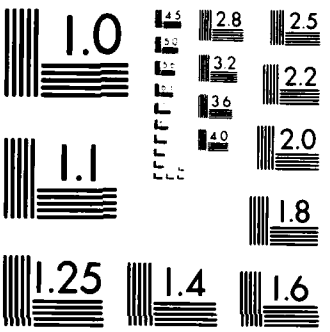

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M-X/MPS

ENVIRONMENTAL

TECHNICAL REPORT

PRELIMINARY FEIS

REVIEW COPY 2 OCTOBER 1981

ETR 18

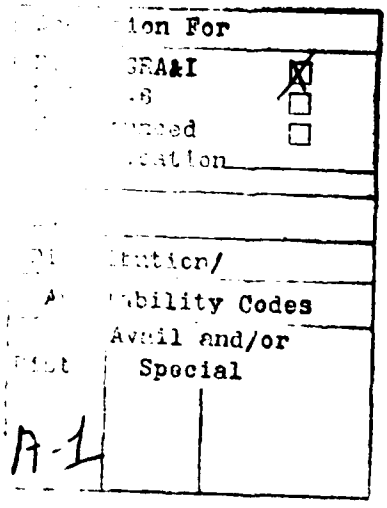
WILDERNESS/NATURAL AREAS

DEPLOYMENT AREA SELECTION AND LAND WITHDRAWAL/ ACQUISITION

DEPARTMENT OF THE AIR FORCE

M-X ETR-18

WILDERNESS/NATURAL AREAS



Prepared for

United States Air Force
Ballistic Missile Office
Norton Air Force Base, California

By

Henningson, Durham & Richardson, Inc.
Santa Barbara, California

REVIEW COPY OF WORK IN PROGRESS

2 October 1981

DEPARTMENT OF THE AIR FORCE
WASHINGTON 20330

OFFICE OF THE ASSISTANT SECRETARY

Federal, State and Local Agencies

On October 2, 1981, the President announced his decision to complete production of the M-X missile, but cancelled the M-X Multiple Protective Shelter (MPS) basing system. The Air Force was, at the time of these decisions, working to prepare a Final Environmental Impact Statement (FEIS) for the MPS site selection process. These efforts have been terminated and the Air Force no longer intends to file a FEIS for the MPS system. However, the attached preliminary FEIS captures the environmental data and analysis in the document that was nearing completion when the President decided to deploy the system in a different manner.

The preliminary FEIS and associated technical reports represent an intensive effort at resource planning and development that may be of significant value to state and local agencies involved in future planning efforts in the study area. Therefore, in response to requests for environmental technical data from the Congress, federal agencies and the states involved, we have published limited copies of the document for their use. Other interested parties may obtain copies by contacting:

National Technical Information Service
United States Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22161
Telephone: (703) 487-4650

Sincerely,

JAMES F. BOATRIGHT
Deputy Assistant Secretary
of the Air Force (Installations)

1 Attachment
Preliminary FEIS

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1.0 INTRODUCTION

Two types of land classes occur in both the Nevada/Utah and the Texas/New Mexico areas that are being studied for possible deployment of the M-X system. Wilderness resources, including areas now under review for possible additions in the wilderness program, are areas legally excluded from M-X deployment. Significant natural areas, for this study, are special areas of ecological importance or sensitivity that are afforded some degree of protection to preserve their significant features. Most are formally classified by federal or state agencies. Several other types of natural areas, not formally classified, are of special local significance. Not included here are natural areas where recreation is a dominant use. While not legally mandated, it is Air Force policy to avoid deployment of M-X system components in all these areas to the maximum degree possible.

The National Wilderness Preservation System (NWPS), initiated under the Wilderness Act of 1964, currently consists of 79,920,639 million acres of land (Hauer, 1981) in the United States classified as wilderness within areas administered by such federal land-managing agencies as the Bureau of Land Management (BLM), U.S. Forest Service (USFS), U.S. Fish and Wildlife Service (FWS), and National Park Service (NPS). Wilderness areas are roadless, primitive, unique natural areas of 5,000 or more contiguous acres of federal land. Wilderness is intended to preserve natural conditions and outstanding opportunities for solitude. For areas classified under the Wilderness Act this is a legal requirement. Sustained rapid growth in the recreational use of wilderness lands threatens the preservation of both naturalness and solitude. In 1979 areas administered by USFS received about 9.5 million visitor-use days (Glen, 1980). The magnitude of the wilderness system, its current and projected use, and the controversy surrounding proposed additions to the wilderness system, make wilderness preservation a public issue.

The mandate to preserve wilderness is based upon a wide range of perceived benefits which society derives from the preservation of wilderness resources. These benefits include:

- Preserving a sample of key ecosystems to ensure biotic diversity
- Conserving gene pools and endangered ecosystems
- Preserving natural areas for research and baseline ecosystem monitoring
- Providing backcountry recreation
- Conserving wildlife and fish
- Conserving scenic resources for tourism
- Protecting a balanced land-use pattern
- Conserving a cultural heritage
- Preserving aesthetic values

- Providing educational opportunities.

All federal land-managing agencies except the Department of Defense and the Department of Energy are required to review the lands under their jurisdiction and to identify areas meeting the wilderness criteria set forth by the Wilderness Act (WA) of 1964 and the Federal Land Policy and Management Act (FLPMA) of 1976. The NPS, USFS, and USFWS have completed reviews of land under their jurisdiction and have identified areas for inclusion in the NWPS. The BLM is currently engaged in such a review.

The requisite characteristics to qualify an area for wilderness status are:

- That it be roadless (no routes improved or maintained by mechanical means) (FLPMA, 1976)

- That it contain 5,000 or more acres of contiguous public land (FLPMA, 1976)

- That it be natural (affected primarily by natural forces with man's impact essentially unnoticeable) (WA, 1964)

- That it be primitive (providing an opportunity for solitude and unconfined recreation) (WA, 1964)

- That there be ecological, geological, scientific, educational, scenic, or historical factors favoring its preservation as wilderness (WA, 1964)

In January 1979, the U.S. Forest Service completed its wilderness identification program called Roadless Area Review and Evaluation II or "RARE II" as published in a Final Environmental Impact Statement. In these recommended areas, "no activities which might alter wilderness qualities of the land will be allowed, unless permitted by law or prior right, and entry for development purposes will be prohibited" (USFS, 1979). The NPS, USFWS, and USFS will have satisfied their mandates when congressional action on those roadless areas currently being reviewed is completed.

The BLM identification of wilderness areas is scheduled for completion in 1991. As of April 1981, over 13 million acres are currently under review in the states of Nevada and Utah. These include Wilderness Study Areas (WSAs) as well as units under appeal to the Interior Board of Land Appeals (IBLA). Although these areas are not yet congressionally designated Wilderness, they are managed as such under the Interim Management Policy and Guidelines set forth by the Department of the Interior. All BLM lands currently under review for incorporation into the NWPS are managed as directed by FLPMA, Section 603 (c); that is, "so as not to impair the suitability of such areas for preservation as wilderness," as prescribed in the Department of the Interior's Interim Policy and Guidelines for Lands Under Wilderness Review, (December 1979). The BLM is directed to prevent unnecessary or undue degradation of the lands and their resources, and to afford them environmental protection. Mineral and grazing uses are allowed to continue in the manner in which they were being conducted on the date of approval of FLPMA (October 21, 1976). Examples of uses that would be incompatible with the Interim Management Guidelines include new utility corridors and power generating stations.

Prior to the passage of FLPMA in 1976, several areas administered by the BLM on public lands had been set aside as Research Natural Areas (RNAs) for scientific and educational purposes, and as Outstanding Natural Areas (ONAs) for recreation. As mandated by FLPMA all these previously designated natural areas were identified as Instant Study Areas (ISAs) and reevaluated for wilderness characteristics.

"Significant natural areas" is an inclusive term subject to a variety of interpretations. Such areas could include an especially scenic landscape, a pristine woods or stream, an attractive camping or fishing area, a unique geologic formation, an historic site, a park, a wildlife refuge, a national monument, and many more. Some areas, such as cultural and historic sites, properly belong in assessments of archaeological or anthropological impacts, others should be included in discussion of land use; most are recreational sites. To avoid redundancy within this environmental impact statement and to confine this study to areas of special ecological sensitivity, the following criteria were developed to define significant natural areas:

- Such areas must be ecologically important requiring management to preserve their intrinsic biological values for scientific study and as representatives of ecological communities

- Such areas must be formally classified by one or more state or federal agencies. To be listed in a survey report as being "significant" is not sufficient reason for inclusion

- Such areas are subject to a management policy administered by a state or federal agency.

- Private lands may be included if they are formally classified even though they may not be managed by a public agency

- Classified areas for which the dominant use is recreation, although ecologically important, shall not be included in the analysis.

Using the above criteria, significant natural areas for this study are: National Natural Landmarks, Research Natural Areas, National Wildlife Refuges, Wildlife Management Areas, National Grasslands, and Areas of Critical Environmental Concern.

A National Natural Landmark is an area identified by the National Park Service as having an ecological or geological feature that is a significant example of the nation's cultural heritage. Once a landmark is designated by the Secretary of the Interior, it is included in the National Registry of Natural Landmarks. Designation of an area as a Natural Landmark does not constitute a land withdrawal, and does not affect ownership of the site. Owners of a Natural Landmark may voluntarily agree to protect their area's outstanding natural values; such an agreement results in designation of the area as a Registered National Natural Landmark.

A Research Natural Area (RNA) is a classification used by several federal land management agencies to designate lands on which various natural features are

preserved in an undisturbed state solely for scientific research and educational purposes. RNAs are part of a national system under development since 1927. There are two primary purposes for establishing RNAs: (1) to preserve a representative array of all significant natural ecosystems and their inherent processes as baseline areas, and (2) to obtain, through scientific education and research, information about natural system structure and function, and to compare these systems with representative manipulated systems. The Research Natural Area system receives no special legislative protection. The additional protection that is afforded RNAs is derived from the agencies that designate them. Unless an activity contributes to the preservation of the designated feature, it is prohibited. Picnicking, camping, hiking, swimming, and gathering are generally discouraged, and sometimes prohibited. Hunting, fishing, and trapping are discouraged, but are permitted subject to state regulation. Scientists wishing to use a particular RNA must obtain permission from the managing agency.

A National Wildlife Refuge is a special habitat within a U.S. Fish and Wildlife-managed system established to safeguard a national network of lands and waters and to make available public benefits that are associated with wildlife, particularly migratory birds and endangered species. In addition to the preservation of wildlife, a National Wildlife Refuge may provide opportunities for scientific studies and wildlife-oriented recreation. It is the policy of the U.S. Fish and Wildlife Service that public use on refuges will be secondary to the primary purpose of management for wildlife.

Wildlife Management Areas are similar to National Wildlife Refuges in objectives; they are managed by agencies other than the U.S. Fish and Wildlife Service.

A National Grassland is part of the National Forest System administered by the U.S. Dept. of Agriculture, Forest Service, for purposes of land conservation and multiple use. Objectives of the project include the development of grassland agriculture, and sustained-yield management of the forage, fish, wildlife, timber, water, and recreational resources of the area. National Grassland resources are managed to maintain soil and vegetative cover. The Secretary of Agriculture may sell, lease, or otherwise transfer National Grasslands for public purposes only; industrial parks and private or commercial enterprises may not be established on National Grasslands.

An Area of Critical Environmental Concern is an area within public lands, administered by the Bureau of Land Management, where special management attention is required to prevent irreparable damage to important historic, cultural, or natural areas, or to protect life and safety from natural hazards.

In the Nevada/Utah study area, more than 2 million acres are occupied by formally classified significant natural areas; an additional 405,000 acres are areas nominated as National Natural Landmarks. In the Texas/New Mexico study area, classified significant natural areas total more than 362,000 acres, with an additional 3,600 acres nominated as National Natural Landmarks.

There are no Areas of Critical Environmental Concern in either study area.

2.0 NEVADA/UTAH REGION

2.1 WILDERNESS

Currently, Nevada and Utah have one Congressionally Designated Wilderness area each, both administered by the USFS: Jarbidge in the Humboldt National Forest in northeastern Nevada, and Lone Peak in the Uinta and Wasatch National Forest of central Utah. These areas are located approximately 125 and 65 mi, respectively, from the nearest system feature and are not likely to be directly affected by the M-X project. As a result of the USFS RARE II program, approximately 212,000 acres of Forest Service roadless areas in the vicinity of the Nevada/Utah study region have been recommended for wilderness status or earmarked for further planning. Administratively Endorsed Wilderness Proposals in the vicinity of the proposed deployment area are: the Desert National Wildlife Range (USFWS), Bryce Canyon (NPS), Zion National Park (NPS), and portions of the Lake Mead National Recreation Area (NPS). Anaho Island in Pyramid Lake and Sheldon National Antelope Refuge, more than 100 mi from the study area in northwestern Nevada, have also been administratively endorsed for wilderness status but are not likely to be directly affected by the project.

As of April 1981, total BLM wilderness resources within the proposed deployment area comprised approximately 2.5 million acres of land, which include designated wilderness study areas resulting from special high-priority project requirements such as land transfers and energy projects as well as those resulting from the November 1980 BLM determinations and subsequent wilderness unit appeals to the Interior Board of Land Appeals (IBLA). The names, unit numbers, and current status for interagency wilderness resources in the study area are presented on a hydrologic subunit basis in Table 2.1-1; data on location and size of these areas are mapped in Figure 2.1-1.

2.2 SIGNIFICANT NATURAL AREAS

Significant natural areas in the Nevada/Utah study area, identified by federal or state agencies as areas to be preserved for their unique ecological or geological characteristics, include 8 designated and 49 potential National Natural Landmarks, 13 National Wildlife Refuges or Wildlife Management Areas, 25 Research Natural Areas, and more than 30 "other" natural areas. Table 2.2-1 lists significant natural areas in the Nevada study area; Table 2.2-2 lists these areas for Utah. Figure 2.2-1 shows their locations. Table 2.2-3 lists these areas by hydrologic subunit.

The National Natural Landmarks Program, formerly administered under the Heritage Conservation and Recreation Service (HCRS), Department of the Interior Division of Natural Landmarks, was consolidated within the National Park Service in late spring 1981. HCRS supplied the most recent information on the status of Natural Landmarks for this impact statement; descriptions were obtained from a comprehensive study of the Great Basin (Bostick et al., 1975). Designated National Natural Landmarks on the Registery in Nevada and Utah are listed below:

1. The Hot Creek Springs and Marsh in Nye County, Nevada is a Registered National Natural Landmark; it is being considered for expansion to

Table 2.1-1. Wilderness resources in and around the Nevada/Utah study area (Page 1 of 4).

Hydrologic Subunit			Wilderness Resource Area					
Number	Name	Managing Agency	Name	Number	Status (April 1981)	Total Resource Acreage	Approximate Wilderness Resource Acreage Within Hydrologic Subunit	Percent[1] Wilderness Resource In Hydrologic Subunit
4	Snake, Nev./Utah	BLM	Deep Creek Mountains	UT-050-020	WSA[2]	68,910	26,875	39
		BLM	Fish Springs Range	UT-050-127	WSA	52,500	10,500	20
		BLM	Granite Spring	NV-040-086	WSA Under Appeal	23,400	23,400	100
		BLM	Conger Mountain	UT-050-035	WSA	22,863	11,889	52
		USFS	Mt. Moriah	4-352	FP[3]	97,205	78,736	81
		USFS	Wheeler Peak	4-359	FP	61,869	44,546	72
		USFS	Highland Ridge	4-391	FP	76,017	23,565	31
		BLM	King Top	UT-050-070	WSA	84,771	31,365	37
		BLM	Wah Wah Mountains	UT-050-073	WSA	35,000	2,450	7
5	Pine, Utah	BLM	Mountain Home Range	UT-040-104	WSA	19,019	4,945	26
		BLM	Central Wah Wah Range	UT-040-204B	IU[4] Under Appeal	37,238	17,502	47
		BLM	Wah Wah Mountains	UT-050-073	WSA	35,000	15,050	43
6	White, Utah	BLM	King Top	UT-050-070	WSA	84,771	47,472	56
		BLM	Notch Peak	UT-050-078	WSA	51,130	17,896	35
		BLM	Conger Mountain	UT-050-035	WSA	22,863	10,974	48
		BLM	Howell Peak	UT-050-077	WSA	23,825	16,201	68
		BLM	Swasey Mountain	UT-050-061	WSA	49,500	20,790	42
		BLM	Fish Springs Range	UT-050-127	WSA	52,500	11,550	22
7	Fish Springs, Utah	BLM	Fish Springs Range	UT-050-127	WSA	52,500	30,450	58
		BLM	Dugway Mountains	UT-020-129	IU Under Appeal	20,638	9,906	48
		BLM	Swasey Mountain	UT-050-061	WSA	49,500	9,405	19
8	Dugway, Utah	BLM	Dugway Mountains	UT-020-129	IU Under Appeal	20,638	10,732	52
9	Government Creek, Utah		None				0	0
46	Sevier Desert, Utah	BLM	Rockwell	UT-050-186	WSA	9,151	9,151	100
		BLM	Swasey Mountain	UT-050-061	WSA	49,500	11,385	23
46A	Sevier Desert-Dry Lake, Utah	BLM	Swasey Mountain	UT-050-061	WSA	49,500	7,920	16
		BLM	Howell Peak	UT-050-077	WSA	23,825	7,624	32
		BLM	Notch Peak	UT-050-078	WSA	51,130	33,235	65
50	Milford, Utah[5]		None				0	0
52	Lund District, Utah[5]		None				0	0
53	Beryl-Enterprise District, Utah[5]	USFS	Pine Valley Mountain	A4-251	Rare II Wilderness Recommendation	83,500	835	1
54	Wah Wah, Utah	BLM	Wah Wah Mountains	UT-050-073	WSA	35,000	17,500	50
		BLM	Central Wah Wah Range	UT-040-204B	IU Under Appeal	37,238	19,736	53
		BLM	King Top	UT-050-070	WSA	84,771	5,934	7
137A	Big Smoky-Tonopah Flat, Nev.	USFS	Arc Dome	4-667	Rare II[6] Wilderness Recommendation	94,370	3,775	4

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Table 2.1-1. Wilderness resources in and around the Nevada/Utah study area (Page 2 of 4).

Hydrologic Subunit			Wilderness Resource Area				Approximate Wilderness Resource Acreage Within Hydrologic Subunit	Percent[1] Wilderness Resource In Hydrologic Subunit
Number	Name	Managing Agency	Name	Number	Status (April 1981)	Total Resource Acreage		
139	Kobeh, Nev.	BLM	Roberts	NV-060-541	WSA Under Appeal	15,090	2,113	14
		BLM	Simpson Park	NV-060-428	WSA Under Appeal	49,670	27,815	56
140A	Monitor-North, Nev.		None				0	0
140B	Monitor-South, Nev.		None				0	0
141	Ralston, Nev.		None				0	0
142	Alkali Spring, Nev.		None				0	0
148	Cactus Flat, Nev.	BLM	Kawich	NV-060-019	WSA Under Appeal	27,360	6,840	25
149	Stone Cabin, Nev.	BLM	Rawhide Mountain	NV-060-059	WSA Under Appeal	64,360	28,318	44
		BLM	Kawich	NV-060-019	WSA Under Appeal	27,360	10,123	37
151	Antelope, Nev.		None				0	0
154	Newark, Nev.		None				0	0
155A	Little Smoky-North, Nev.	BLM	Antelope	NV-060-231/241	WSA Under Appeal	87,400	11,362	13
		BLM	Park Range	NV-040-154	WSA Under Appeal	46,500	15,810	34
155C	Little Smoky-South, Nev.	BLM	Palisade Mesa	NV-060-142/162	WSA Under Appeal	99,550	11,946	12
		BLM	The Wall	NV-060-163	WSA Under Appeal	38,000	4,560	12
156	Hot Creek, Nev.	BLM	S. Reveille	NV-060-112	WSA Under Appeal	106,200	16,992	16
		BLM	Kawich	NV-060-019	WSA Under Appeal	27,360	10,397	38
		BLM	Palisade Mesa	NV-060-142/162	WSA Under Appeal	99,550	40,816	41
		BLM	Rawhide Mountain	NV-060-059	WSA Under Appeal	64,360	36,042	56
		BLM	Fandango	NV-060-190	WSA Under Appeal	40,940	19,651	48
		BLM	Morey	NV-060-191	WSA Under Appeal	20,120	20,120	100
		BLM	Antelope	NV-060-231/241	WSA Under Appeal	87,400	40,204	46
		BLM	Park Range	NV-040-154	WSA Under Appeal	46,500	24,645	53
170	Penoyer, Nev.	USFS	Quinn	4-360	Rare II Wilderness Recommendation	88,616	14,179	16
		BLM	Worthington Mountains	NV-040-242	WSA Under Appeal	47,100	30,615	65
171	Coal, Nev.	BLM	Weepah Spring	NV-040-246	WSA	61,000	17,690	29
172	Garden, Nev.	USFS	Quinn	4-360	Rare II Wilderness Recommendation	88,616	22,154	25
		USFS	Grant Range	4-371	Rare II Wilderness Recommendation	98,904	48,463	49
		BLM	Worthington Mountains	NV-040-242	WSA Under Appeal	47,100	16,485	35
173A	Railroad-South, Nev.	BLM	South Reveille	NV-060-112	WSA Under Appeal	106,200	89,208	84

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Table 2.1-1. Wilderness resources in and around the Nevada/Utah study area (Page 3 of 4).

Hydrologic Subunit			Wilderness Resource Area					
Number	Name	Managing Agency	Name	Number	Status (April 1981)	Total Resource Acreage	Approximate Wilderness Resource Acreage Within Hydrologic Subunit	Percent[1] Wilderness Resource In Hydrologic Subunit
173B	Railroad-North, Nev.	BLM	Palisade Mesa	NV-060-142/162	WSA Under Appeal	99,550	46,789	47
		BLM	The Wall	NV-060-163	WSA Under Appeal	38,000	33,820	89
		USFS	Quinn	4-360	Rare II Wilderness Recommendation	88,616	52,283	59
		BLM	Grant Range	NV-060-166(A,B)	WSA Under Appeal	5,840	5,840	100
		USFS	Grant Range	4-371	Rare II Wilderness Recommendation	98,904	39,562	40
		BLM	Blue Eagle	NV-060-158/199	WSA Under Appeal	59,560	59,560	100
		BLM	Riordan's Well	NV-040-166	WSA Under Appeal	56,800	28,400	50
174	Jakes, Nev.		None				0	0
175	Long, Nev.		None				0	0
178B	Butte-South, Nev.	BLM	Goshute Canyon	NV-040-015	Non-WSA Under Appeal	99,100	16,847	17
179	Steptoe, Nev.	BLM	Goshute Canyon	NV-040-015	Non-WSA Under Appeal	99,100	54,505	55
		BLM	Martin Spring	NV-040-123	IU Under Appeal	24,800	4,960	20
		BLM	Mt. Grafton	NV-040-169	WSA	54,500	7,085	13
		BLM	South Egan Range	NV-040-168	WSA	85,100	851	1
180	Cave, Nev.	BLM	South Egan Range	NV-040-168	WSA	85,100	23,828	28
		BLM	Mt. Grafton	NV-040-169	WSA	54,500	26,705	49
		BLM	Far South Egan	NV-040-172	WSA	49,800	24,402	49
181	Dry Lake, Nev.		None				0	0
182	Delamar, Nev.	BLM	Delamar Mountains	NV-050-0177	WSA	126,700	16,471	13
		BLM	South Pahrocs/Hiko	NV-050-0132	WSA	28,600	6,006	21
183	Lake, Nev.	BLM	Table Mountain	NV-040-197	WSA Under Appeal	35,600	12,104	34
		BLM	Fortification Range	NV-040-177	WSA	39,600	26,532	67
		BLM	Mt. Grafton	NV-040-169	WSA	54,500	20,710	38
		BLM	Parsnip Peak	NV-040-206	WSA	77,000	770	1
184	Spring, Nev.	BLM	Table Mountain	NV-040-197	WSA Under Appeal	35,600	3,560	10
		USFS	Highland Ridge	4-391	FP	76,017	24,325	32
		USFS	Wheeler Peak	4-359	FP	61,869	17,323	28
		USFS	Mt. Moriah	4-352	FP	97,205	18,469	19
		BLM	Fortification Range	NV-040-177	WSA	39,600	13,068	33
196	Hamlin, Nev./Utah	BLM	Mountain Home Range	UT-040-104	IU Under Appeal	19,019	14,264	75
		BLM	Table Mountain	NV-040-197	WSA Under Appeal	35,600	5,696	16
		BLM	White Rock Range	NV-040-202	WSA	19,590	8,617	44
		USFS	Highland Ridge	4-391	FP	76,017	28,126	37

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Table 2.1-1. Wilderness resources in and around the Nevada/Utah study area (Page 4 of 4).

Hydrologic Subunit			Wilderness Resource Area					
Number	Name	Managing Agency	Name	Number	Status (April 1981)	Total Resource Acreage	Approximate Wilderness Resource Acreage Within Hydrologic Subunit	Percent[1] Wilderness Resource In Hydrologic Subunit
202	Patterson, Nev.	BLM	Parsnip Peak	NV-040-206	WSA	77,000	40,040	52
205	Meadow Valley Wash, Nev.[5]	BLM	Meadow Valley Mountains	NV-050-0156	WSA	185,744	143,023	77
		BLM	Mormon Mountains	NV-050-0161	WSA	162,887	112,392	69
		BLM	Grapevine Spring	NV-050-0139	WSA	84,935	69,647	82
207	White River, Nev.	USFS	Grant Range	4-371	Rare II Wilderness Recommendation	98,904	10,879	11
		BLM	Riordan's Well	NV-040-166	WSA Under Appeal	56,800	28,968	51
		BLM	Far South Egan	NV-040-172	WSA	49,800	25,398	51
		BLM	South Egan Range	NV-040-168	WSA	85,100	60,421	71
		BLM	Martin Spring	NV-040-123	IU Under Appeal	24,800	19,840	80
208	Pahroc, Nev.	BLM	Weepah Spring	NV-040-246	WSA	61,000	43,310	71
209	Pahranagat, Nev.	Fish and Wildlife	Desert National Wildlife Range	FW-915	AEWP[7]	1,460,340	29,207	2
		BLM	E. Pahranagat	NV-050-0131	WSA Under Appeal	16,200	11,502	71
		BLM	Medsger Pass	NV-050-0154	WSA Under Appeal	11,462	11,462	100
		BLM	Lower Pahranagat Lake	NV-050-0165	WSA Under Appeal	3,350	3,350	100
		BLM	South Pahrocs/Hiko	NV-050-0132	WSA	28,600	22,594	79
		BLM	Delamar Mountains	NV-050-0177	WSA	126,700	8,869	7
210	Coyote Spring, Nev.[5]	Fish and Wildlife	Desert National Wildlife Range	FW-915	AEWP	1,460,340	189,844	13
		BLM	F & W #3	NV-050-0217	WSA	22,002	3,080	14
		BLM	F & W #2	NV-050-0216	WSA	16,516	16,516	100
		BLM	Arrow Canyon Range	NV-050-0215	WSA	28,000	9,800	35
		BLM	Meadow Valley Mountains	NV-050-0156	WSA	185,744	26,004	14
		BLM	F & W #1	NV-050-0201	WSA	8,991	8,991	100
		BLM	Evergreen	NV-050-01R-16 (A,B,C)	WSA	2,834	2,834	100
		BLM	Delamar Mountains	NV-050-0177	WSA	126,700	77,287	61
219	Muddy Springs, Nev.		Arrow Canyon Range	NV-050-0215	WSA	28,000	17,360	62

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[1]Due to an accuracy level of ± 1 percent, these figures have been rounded to the nearest whole number. Therefore, calculated total acreage figures may not precisely correspond to managing agency total acreage figures.

[2]Wilderness Study Area.

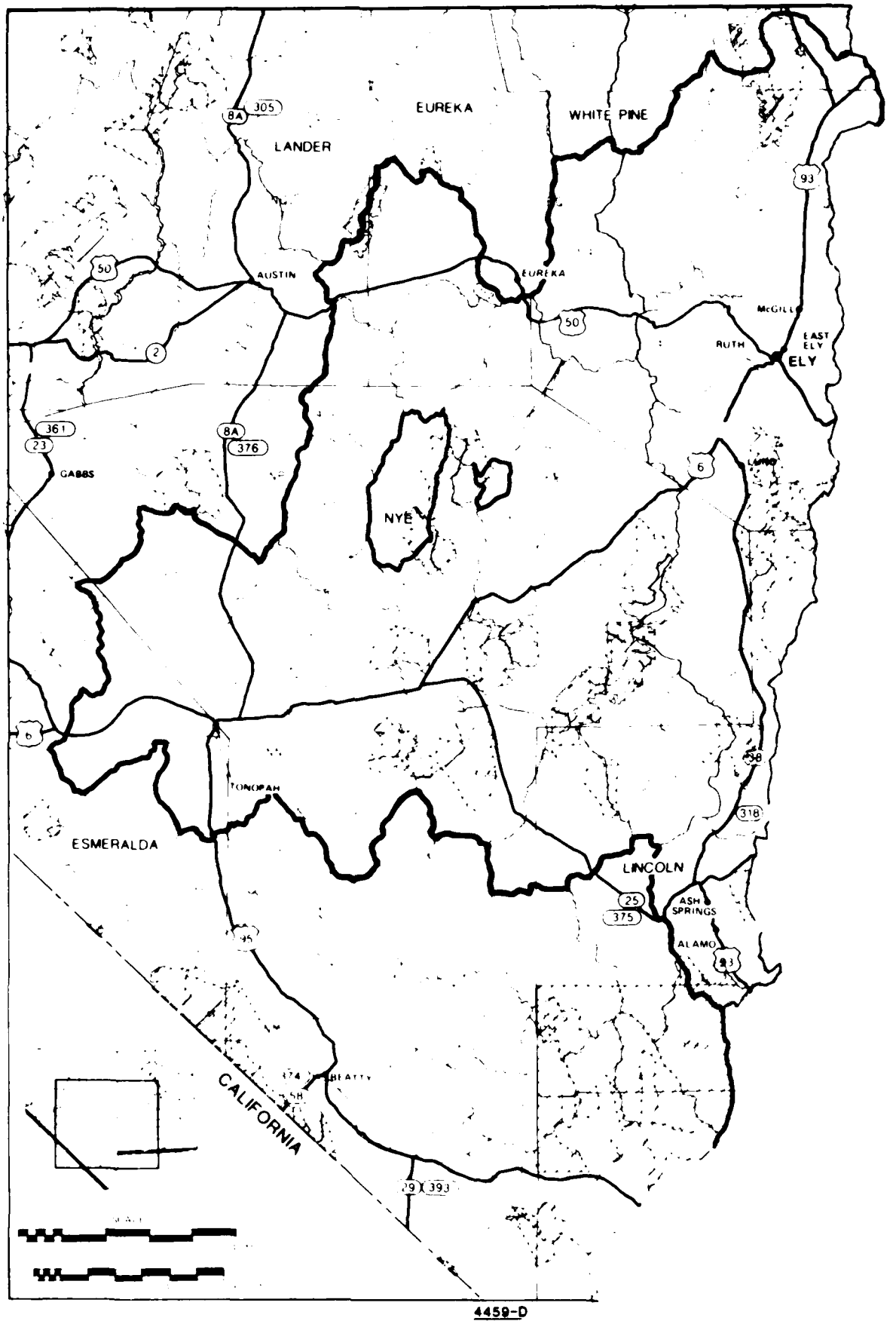
[3]Further Planning.

[4]Inventory Unit.

[5]Subunits containing OB sites.

[6]Roadless Area Review and Evaluation.

[7]Administratively Endorsed Wilderness Proposal



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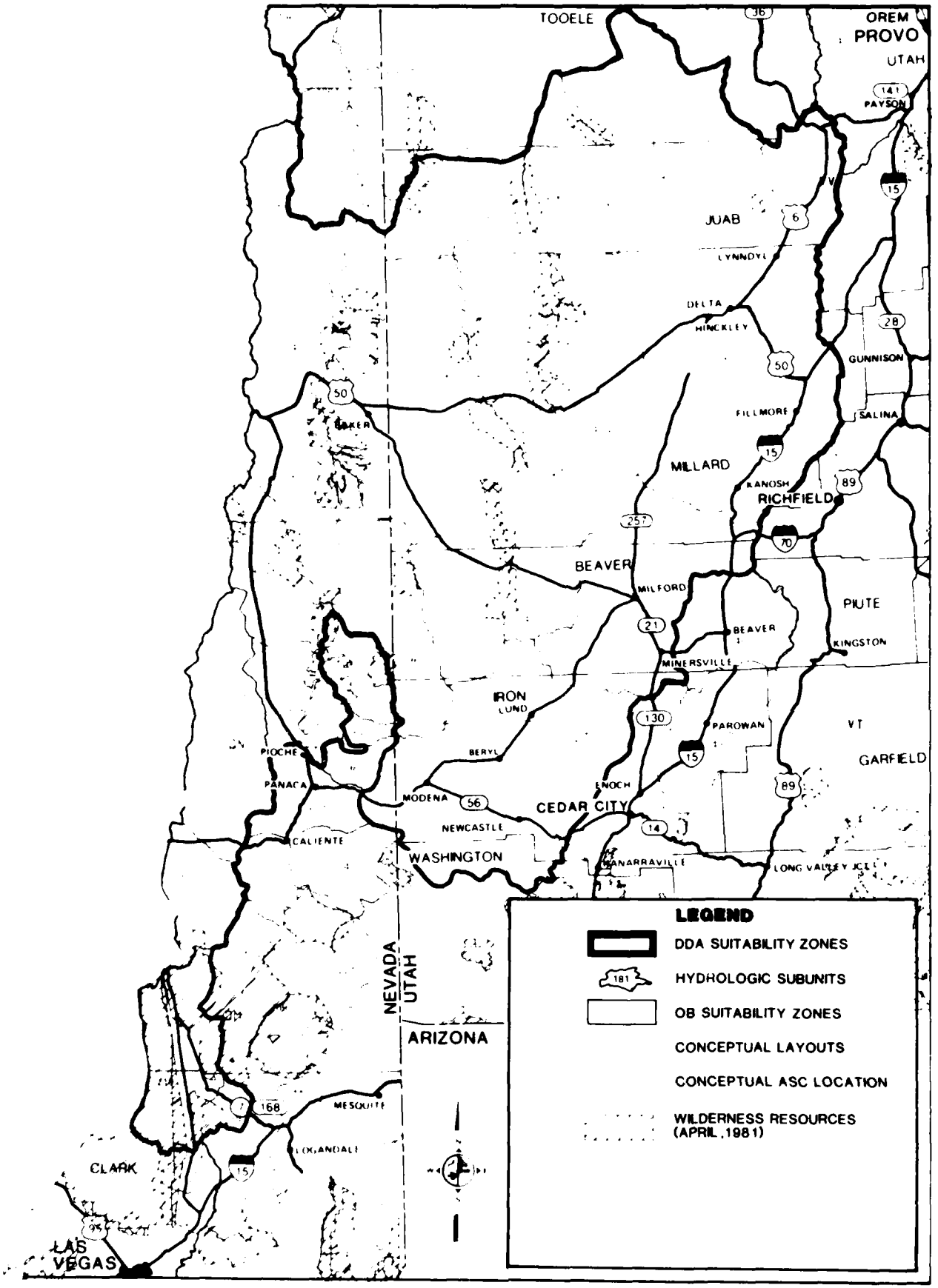

Figure 2.1-1. Wilderness resources in the Nevada/Utah study area.

4458-D
CA-0399-D

Table 2.2-1. Inventory of significant natural areas.* Nevada study area (Page 1 of 5).

Significant Natural Area	County	Acres	Managing Agency
National Natural Landmarks			
Designated			
Hot Creek Springs and Marsh[1]	Nye	15	State
Ichthyosaur Site[1]	Nye	200	State
Lunar Crater	Nye	400	BLM
Ruby Lake Marsh	Elko, White Pine	12,000	USFWS
Timber Mountain Caldera	Nye	263,680	DOE: DOD
Valley of Fire[1]	Clark	30,000	State
Potential			
Arc Dome	Nye	41,000	USFS
Big Dune Natural Area	Nye	5,760	BLM
Charlestown Peak	Clark	N/A	--
Desert National Wildlife Range	Clark, Lincoln	1,443,000	USFWS
Diana's Punchbowl[2]	Nye	160	Private
Duckwater	Nye	100	Indian/Public
Frenchman Flat Fossil Site	Nye	N/A	DOE
Frenchman Mountain-Rainbow Gardens[2]	Clark	N/A	--
Hot Creek Range[2]	Nye	266,440	BLM; Private
Morey Peak	Nye	23,680	BLM
Leviathan Cave	Lincoln	3,840	BLM
Lexington Arch	White Pine	40	USFS
McCullough Range	Clark	384,840	BLM; Private

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Table 2.2-1. Inventory of significant natural areas.* Nevada study area (Page 2 of 5).

Significant Natural Area	County	Acres	Managing Agency
National Natural Landmarks			
Potential (continued)			
Mormon Mesa	Clark	23,200	BLM; NPS
Mount Grafton	Lincoln, White Pine	38,400	BLM
Mount Jefferson Research Natural Area	Nye	3,490	USFS
Pupfish	Nye	176,380	BLM, NPS, State
Red Rock Escarpment	Clark	77,770	BLM; State
Pine Creek Natural Area	Clark	240	BLM
Roberts Mountains	Eureka	62,500	BLM
Ruby Mountains[2]	Elko	40,000	USFS; Private
Sarcobatus Flat[2]	Nye	50,000	BLM
Snake Range[2]	White Pine	N/A	USFS
Mount Moriah	White Pine	120,000	USFS
Wheeler Peak Scenic Area	White Pine	28,000	USFS
Spring Valley White Sage Flat	White Pine	1,820	BLM
Troy Peak-Hooper Canyon	Nye	97,540	USFS
Virgin River	Clark	2,000	State
Weiser Bowl	Clark	4,000	BLM
White Mountains[2]	Esmeralda	329,000	USFS
The Wild Granites	Nye	11,000	USFS

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Table 2.2-1. Inventory of significant natural areas.* Nevada study area (Page 3 of 5).

Significant Natural Area	County	Acres	Managing Agency
Refuges			
Desert National Wildlife Range	Clark, Lincoln	1,588,458	USFWS
Key-Pittman[3]	Lincoln	1,200	State
Kirch	Nye	5,593	State
Moapa Valley[4]	Clark	11	USFWS
Overton[3]	Clark	14,575	State
Pahranagat	Lincoln	5,381	USFWS
Pupfish[3]	Nye	137	BLM
Ruby Lake[4]	Elko, White Pine	37,621	USFWS
Railroad Valley[3]	Nye	14,710	BLM
Research Natural Areas			
Basin	Clark	650	USFWS
Carpenter Canyon	Clark	2,250	USFS
Deadhorse	Clark	8,640	USFWS
Goshute Canyon	White Pine	7,650	BLM
Hayford Peak	Clark	2,000	USFWS
Heusser Mountain Bristlecone Pine	White Pine	480	BLM
Mount Jefferson	Nye	3,490	USFS
Mountain Meadow	Nye	22	BLM
Papoose Lake	Lincoln	23,680	USFWS
Pine Creek	Clark	150	BLM
Pinyon-Joshua Transition	Esmeralda	560	BLM

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Table 2.2-1. Inventory of significant natural areas.* Nevada study area (Page 4 of 5).

Significant Natural Area	County	Acres	Managing Agency
Research Natural Areas (continued)			
Pinyon-Juniper	Clark	500	USFWS
Ruby Valley Marsh	Elko, White Pine	10,000	USFWS
Shoshone Ponds	White Pine	1,240	BLM
Shoshone Pygmy Sage	White Pine	160	BLM
Sunrise Mountain	Clark	10,240	BLM
Swamp Cedar	White Pine	3,200	BLM
Virgin Mountain	Clark	6,560	BLM
Areas of Critical Environmental Concern			
None			
Other Natural Areas[5]			
Arrow Canyon	Clark	11,120	BLM
Black Mountain Caldera	Nye	--	BLM;USAF
Cathedral Canyon Natural Arch	White Pine	1	USFS
Cherry Creek's Engleman Spruce	Elko	6,880	BLM
Clover Creek and Mountains	Lincoln	41,600	BLM
Coal Valley	Nye	495	BLM
Crescent Valley Grassland	Eureka	--	BLM;private
Delamar	Lincoln	139,000	BLM
Devil's Throat	Clark	1	BLM
Eureka Formation Fossils	White Pine	495	USFS
Fish Lake Valley Badlands	Esmeralda	--	BLM
Gold Butte	Clark	--	BLM

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Table 2.2-1. Inventory of significant natural areas.* Nevada study area (Page 5 of 5).

Significant Natural Area	County	Acres	Managing Agency
Other Natural Areas[5] (continued)			
Ikes Canyon	Nye	1,920	BLM;USFS
Lone Mountain	Esmeralda	--	BLM
McCan Canyon Geologic Area	Nye	1,360	USFS
Meadow Valley Mountains	Lincoln	124,490	BLM
Meiklejohn Peak Fossil Site	Nye	--	BLM
Mormon Peak	Lincoln	19,200	BLM
Osceola Cave and Arch	White Pine	1,280	BLM
Pearl Peak Bristlecone Pine	Elko	9,600	BLM
Pilot Mountain	Mineral	--	BLM
Pilot Peak Engleman Spruce	Elko	26,240	BLM
Railroad Pass Natural Arch	White Pine	10	BLM
Shipley Hot Spring	Eureka	40	Private
Silver Peak Natural Area	Esmeralda	640	BLM
Spencer Hot Springs	Lander	640	BLM
Toquima Cave	Lander	1	USFS

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*Areas listed are primarily those formally classified by federal or state managing agencies. Unclassified areas, except where noted, are not listed. Also not listed are areas for which recreation is a dominant use.

[1]Registered.

[2]In nominating process.

[3]Wildlife Management Area.

[4]National Wildlife Refuge.

[5]Areas are not classified natural areas by federal managing agencies but are considered sensitive by the state.

Table 2.2-2. Inventory of significant natural areas,* Utah study area (Page 1 of 3)

Significant Natural Area	County	Acres	Managing Agency
National Natural Landmarks			
Designated			
Joshua Tree Natural Area[1]	Washington	1,040	BLM
Neffs Canyon Cave[1]	Salt Lake	--	USFS
Potential			
Antelope Spring Trilobite Beds[2]	Millard	10,000	BLM
Bonneville Salt Flats[2]	Tooele	36,480	BLM; State
Brighton Basin Igneous and Metamorphic Rocks	Utah, Wasatch, Salt Lake	2,880	USFS
Cinder Cone-Head of Snow Canyon	Washington	320	State; Private
Deep Creek Mountains	Juab, Tooele	129,367	BLM
Desert Range Research Natural Area[2]	Millard	1,846	USFS
Faulted Basalts in Virgin River Gorge, Hurricane	Washington	960	Private
Fish Springs	Juab	17,992	USFWS
Inverted Valleys, St. George	Washington	16,000	Private
Mount Nebo	Juab, Utah	25,280	USFS; State
Mount Timpanogos Oquirrh Formation	Utah	6,080	USFS
Pink Sand Dunes, Hurricane	Washington	3,840	State
Red Mountain (Dixie Corridor)	Washington	16,000	BLM

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Table 2.2-2. Inventory of significant natural areas,* Utah study area (Page 2 of 3).

Significant Natural Area	County	Acres	Managing Agency
National Natural Landmarks			
Potential (continued)			
Ripple Arch	Washington	760	BLM
Scenic Overlook Hurricane Cliffs	Washington	1,280	State
Spanish Fork Peaks-Maple Mountain Faceted Spurs and Glaciation	Utah	6,800	USFS
Steamboat Mountain	Iron	7,680	BLM
Thistle Canyon Landslides	Utah	1,088	Private
Refuges			
Clear Lake[3]	Millard	6,150	State
Fish Springs[4]	Juab	17,992	USFWS
Indian Peak[5]	Beaver	10,240	State
Topaz Marsh[3]	Juab	4,142	State
Research Natural Areas			
Bighorn	Washington	5,760	NPS (Zion)
Cedar Breaks	Iron	5,230	NPS (Zion)
Desert Range[6]	Millard	1,846	USFS
Joshua Tree[7]	Washington	1,040	BLM
Kolob Mesas	Washington	500	NPS (Zion)
Partridge Mountain	Millard	1,200	USFS
West Rim-Phantom Valley	Washington	15,360	NPS (Zion)

T4775/9-19-817-29-81

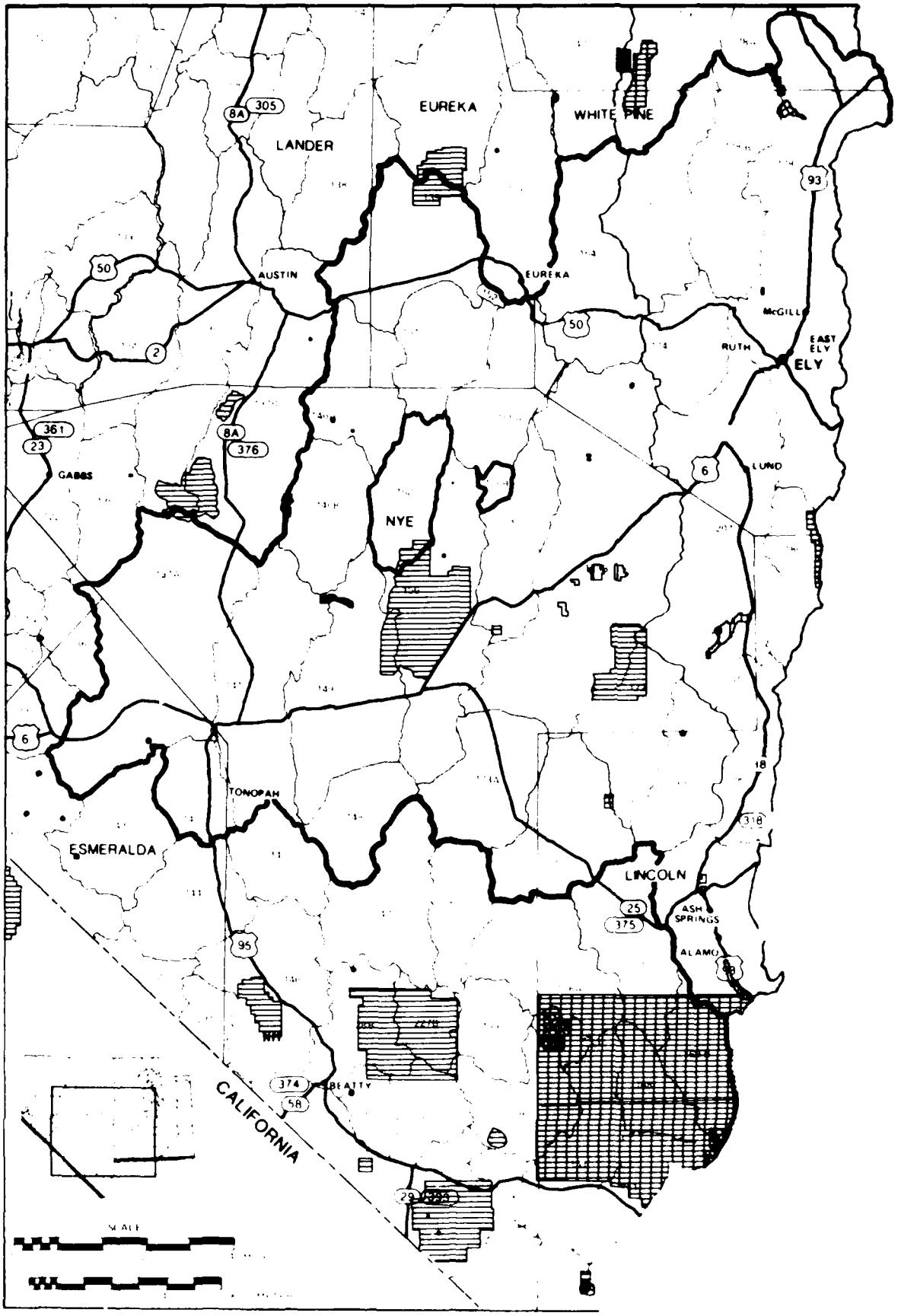
Table 2.2-2. Inventory of significant natural areas,* Utah study area (Page 3 of 3).

Significant Natural Area	County	Acres	Managing Agency
Areas of Critical Environmental Concern			
None			
Other Natural Areas[8]			
Desert Experimental Range	Millard	55,680	USFS
Fumarole Butte	Juab	1,920	BLM
Millard County Deer Winter Range	Millard	16,538	State
Red Mountain	Washington	16,000	BLM
The Caves of Gandy Mountain	Millard	1,280	BLM

T4775/9-19-81

*Areas listed are primarily those formally classified by federal or state managing agencies. Unclassified areas, except where noted, are not listed. Also not listed are areas for which recreation is a dominant use.

[1]Registered.
[2]In nominating process.
[3]Waterfowl Management Area.
[4]National Wildlife Refuge.
[5]Wildlife Management Area.
[6]Within Desert Experimental Range.
[7]National Natural Landmark.
[8]Not classified by federal agency.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WHITE PINE
LANDER
305
8A
93
50
AUSTIN
EUREKA
McGILL
RUTH
EAST ELY
ELY
2
361
23
8A
376
GABBS
6
LUND
NYE
6
TONOPAH
ESMERALDA
318
LINCOLN
25
375
ASH SPRINGS
ALAMO
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374
58
BEATTY
CALIFORNIA
SCALE

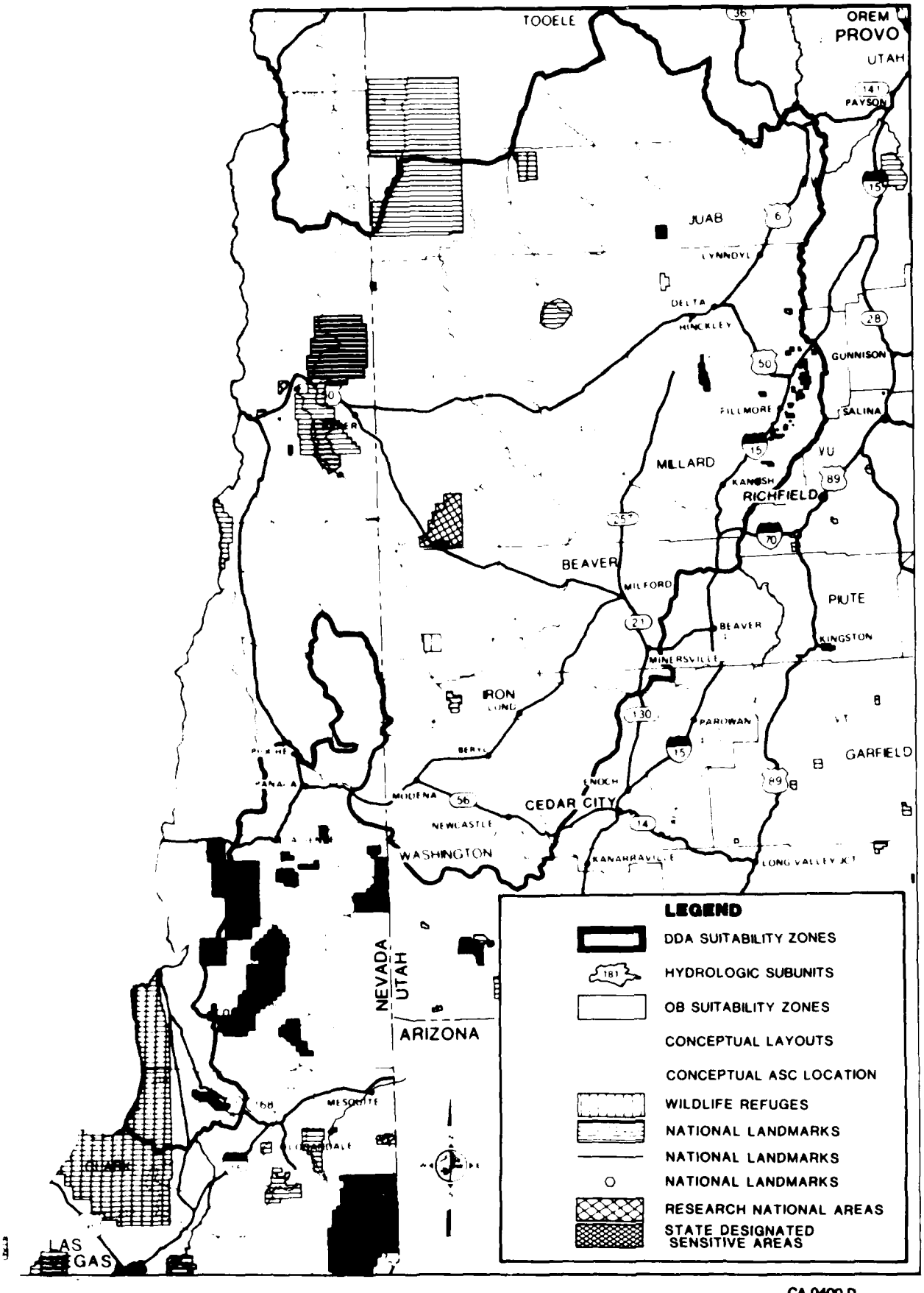

Figure 2.2-1. Significant natural areas in the Nevada/Utah study area.

Table 2.2-3. Significant natural areas in and around the Nevada/Utah study area by hydrologic subunit (Page 1 of 4).

Hydrologic Subunit No.	Hydrologic Subunit Name	Significant Natural Area	County	Total Acreage	Approximate SNA Acreage Within Subunit
4	Snake, Nev./Utah	Snake Range	White Pine	238,455	176,455
		Deep Creek Mountains	Juab, Tooele	129,365	50,872
		Wheeler Peak Scenic Area	White Pine	28,000	22,400
		Lexington Arch	White Pine	40	40
		Desert Experimental Range	Millard	55,680	10,000
		The Caves of Gandy Mountain	Millard	1,280	1,280
		Mt. Moriah	White Pine	120,000	84,000
5	Pine, Utah	Desert Range Research Natural Area	Millard	1,846	1,846
		Desert Experimental Range	Millard	55,680	45,671
		Indian Peak Wildlife Management Area	Beaver	10,240	10,240
6	White, Utah	Antelope Spring Trilobite Beds	Millard	10,000	300
7	Fish Springs, Utah	Fish Springs National Wildlife Refuge	Juab	17,992	17,992
8	Dugway Creek, Utah	None	--	--	--
9	Government Creek, Utah	None	--	--	--
46	Sevier Desert, Utah	Clear Lake Waterfowl Management Area	Millard	6,150	6,150
		Partridge Mountain	Millard	1,200	1,200
		Fumarole Butte	Juab	1,920	1,920
		Antelope Spring Trilobite Beds	Millard	10,000	3,300
		Topaz Marsh Waterfowl Management Area	Juab	4,142	4,142
46A	Sevier Desert-Dry Lake, Utah	Antelope Spring Trilobite Bed	Millard	10,000	6,300
50	Milford, Utah[1]	None	--	--	--
52	Lund District, Utah[1]	Steamboat Mountain	Iron	7,680	7,680
53	Beryl-Enterprise District, Utah[1]	None	--	--	--
54	Wah Wah, Utah	None	--	--	--
137A	Big Smoky-Tonopah Flat, Nev.	Arc Dome	Nye	41,000	2,870
		Lone Mountain	Esmeralda	495	495
139	Kobeh, Nev.	Roberts Mountains	Eureka	62,500	25,625
140A	Monitor-North, Nev.	Diana's Punchbowl	Nye	160	160
		Ike's Canyon	Nye	1,920	1,920

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Table 2.2-3. Significant natural areas in and around the Nevada/Utah study area by hydrologic subunit (Page 2 of 4).

Hydrologic Subunit No.	Hydrologic Subunit Name	Significant Natural Area	County	Total Acreage	Approximate SNA Acreage Within Subunit
140B	Monitor-South, Nev.	Mt. Jefferson Research Natural Area	Nye	3,490	1,430
141	Ralston, Nev.	McCan Canyon Geologic Area	Nye	1,360	325
142	Alkali Spring, Nev.	None	--	--	--
148	Cactus Flat, Nev.	None	--	--	--
149	Stone Cabin, Nev.	Hot Creek Range	Nye	266,440	31,970
		McCan Canyon Geologic Area	Nye	1,360	1,035
151	Antelope, Nev.	None	--	--	--
154	Newark, Nev.	None	--	--	--
155A	Little Smoky-North, Nev.	None	--	--	--
155C	Little Smoky-South, Nev.	Lunar Crater	Nye	400	355
156	Hot Creek, Nev.	Hot Creek Range	Nye	266,440	21,580
		Lunar Crater	Nye	400	45
170	Penoyer, Nev.	Leviathan Cave	Lincoln	3,840	2,805
171	Coal, Nev.	Coal Valley	Nye	495	495
172	Garden, Nev.	Leviathan Cave	Lincoln	3,840	1,035
		Troy Peak-Hooper Canyon	Nye	97,540	41,940
173A	Railroad-South, Nev.	None	--	--	--
173B	Railroad-North, Nev.	Railroad Valley Wildlife Management Area	Nye	14,710	14,710
		Troy Peak-Hooper Canyon	Nye	97,540	49,745
		Duckwater	Nye	100	100
		Cathedral Canyon Natural Arch	White Pine	1	1
174	Jakes, Nev.	None	--	--	--
175	Long, Nev.	None	--	--	--
178B	Butte Valley-South, Nev.	Goshute Canyon	White Pine	7,650	995
179	Steptoe, Nev.[1]	Goshute Canyon	White Pine	7,650	6,655
		Heusser Mountain Bristle Cone Pine	White Pine	480	480
180	Cave, Nev.	Mount Grafton	Lincoln, White Pine	38,400	16,130

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Table 2.2-3. Significant natural areas in and around the Nevada/Utah study area by hydrologic subunit (Page 3 of 4).

Hydrologic Subunit No.	Hydrologic Subunit Name	Significant Natural Area	County	Total Acreage	Approximate SNA Acreage Within Subunit
181	Dry Lake, Nev.	Delamar	Lincoln	139,000	11,000
182	Delamar, Nev.	Delamar	Lincoln	139,000	34,700
183	Lake, Nev.	Mount Grafton	Lincoln, White Pine	38,400	22,270
184	Spring, Nev.	Osceola Cave and Arch	White Pine	1,280	1,280
		Mount Moriah	White Pine	120,000	36,000
		Swamp Cedar Research Natural Area	White Pine	3,200	3200
		Eureka Formation Fossils	White Pine	495	495
		Spring Valley White Sage Flat	White Pine	1,820	1,820
		Shoshone Pygmy Sage Research Natural Area	White Pine	160	160
		Shoshone Ponds	White Pine	1,240	1,240
		Snake Range	White Pine	238,455	59,615
		Wheeler Peak Scenic Area	White Pine	28,000	4,200
196	Hamlin, Nev./Utah	Snake Range	White Pine	238,455	2,385
		Wheeler Peak Scenic Area	White Pine	28,000	1,400
202	Patterson, Nev.	None	--	--	--
205	Meadow Wash, Nev.[1]	Mormon Peak	Lincoln	19,200	10,000
		Meadow Valley Mountains	Lincoln	124,490	110,795
		Delamar	Lincoln	139,000	41,700
		Clover Creek & Mountains	Lincoln	41,600	13,310
207	White River, Nev.	Kirch Wildlife Management Area	Nye	5,595	5,595
		Troy Peak-Hooper Canyon	Nye	97,540	58,525
		Hot Creek Springs and Marsh	Nye	15	15
208	Pahroc, Nev.	None	--	--	--
209	Pahranagat, Nev.	Key-Pittman Wildlife Management Area	Lincoln	1,200	1,200
		Pahranagat National Wildlife Refuge	Lincoln	5,380	5,380
		Desert National Wildlife Range	Clark, Lincoln	1,588,458	31,770

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Table 2.2-3. Significant natural areas in and around the Nevada/Utah study area by hydrologic subunit (Page 4 of 4).

Hydrologic Subunit No.	Hydrologic Subunit Name	Significant Natural Area	County	Total Acreage	Approximate SNA Acreage Within Subunit
210	Coyote Spring, Nev.[1]	Meadow Valley Mountains	Lincoln	124,490	1,245
		Delamar	Lincoln	139,000	1,390
		Desert National Wildlife Range	Clark, Lincoln	1,588,458	190,615
		Pinyon-Juniper Research Natural Area	Clark	500	500
		Deadhorse Research Natural Area	Clark	8,640	520
		Arrow Canyon	Clark	11,120	4,115
219	Muddy Springs, Nev.[1]	Arrow Canyon	Clark	11,120	7,005
		Moapa Valley National Wildlife Refuge	Clark	11	11

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[1] Hydrologic subunit associated with OB.

Sources: Bostick et al., 1975; Federal Committee on Research Natural Areas, 1968; Federal Committee on Ecological Reserves, 1977; Heritage Conservation and Recreation Service, 1980.

include the Wayne Kirch Wildlife Management Area. The springs and creek support a good population of the rare White River Springfish (Crenichthys baileyi), and the marsh is a haven for wildlife. The Nevada Department of Wildlife has fenced this area to provide a sanctuary for the rare fish.

2. The Ichthyosaur Site in the Toiyabe National Forest in Nye County, also a Registered National Natural Landmark is an outstanding fossil area, where fossil remains of the Jurassic ichthyosaur have been found. The site is a state park.

3. Lunar Crater in Nye County is an outstanding geological feature, about 3,800 ft across and 430 ft deep which covers more than 400 acres (BLM, 1979). The volcanic field surrounding it is noted for its lava flows, cinder cones, and numerous craters as well as for the beautiful displays of wildflowers, particularly the showy scarlet globe mallow (Sphaeralcea spp.). It is currently managed by the BLM as a recreation area.

4. Ruby Lake Marsh, in Elko and White Pine counties, is an important nesting area for greater sandhill cranes and trumpeter swans, both rare and majestic birds. The marsh is one of the largest and finest natural wetlands in Nevada.

5. Timber Mountain Caldera in Nye County is an outstanding example of volcanic phenomena which created an elliptical dome some 8 by 10 mi in extent. The site is in the western portion of the Nevada Test Site and the Nellis Air Force Gunnery Range.

6. Valley of Fire near Las Vegas is a state park managed as a natural area for its unusual red rock formations and excellent examples of both Mojave Desert and Great Basin flora and fauna. It is a Registered National Natural Landmark.

7. Joshua Tree Natural Area, located on bajadas along the southwest flank of the Beaver Dam Mountains in southern Washington County, Utah, is the only joshua tree forest in Utah and, with a few exceptions, is the northernmost stand of tree yuccas in the United States. The area has also been set aside as a Research Natural Area by the BLM and is used for grazing.

8. Neffs Canyon Cave, formed by the capture of a surface stream, is an extremely dangerous cave with no horizontal passages. Most passages dip steeply at a 45-60 degree gradient.

National Wildlife Refuges and Ranges are set aside by the U.S. Fish and Wildlife Service principally for the preservation of wetland habitats for migratory waterfowl, endangered species, or significant habitats of big game populations. The Desert National Wildlife Range is one of the nation's largest wildlife conservation areas. Its purpose is to preserve the desert bighorn sheep and the habitat vital to it, and other wildlife species. The Wildlife Range varies in elevation from 2,500 ft to nearly 10,000 ft. Although there are many outdoor recreational activities permitted on the Range, the number of people engaged in any one recreational activity at any

one time is limited. Ruby Lake and Fish Springs National Wildlife Refuges provide havens for several species of waterfowl, shore birds, and sandhill cranes; Ruby Lake also harbors Canada geese, sage grouse, and muskrats. The two primary species in Pahranagat are ducks, and geese. The Moapa Valley National Wildlife Refuge was purchased early in 1979 as part of a recovery plan to acquire habitats for the endangered Moapa dace. A former habitat for Moapa dace, it is now being developed to accept the species from other habitats. Clear Lake Waterfowl Management Area and Kirch Wildlife Management Area, managed by the Nevada Division of Wildlife, provide roosting sites for the endangered bald eagle.

Research Natural Areas (RNAs) in the Nevada/Utah study area are managed by the Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service (USFS), and the National Park Service (NPS). All agencies employ a similar set of regulations to ensure the protection of the scientific and educational values for which the RNAs were designated, although specific management policies are determined on a case-by-case basis.

"Other" natural areas are not formally classified into the above designations by federal managing agencies. Most of these areas are managed by the BLM. In Nevada, the Division of State Parks has identified as significant all the "other" natural areas listed in Table 2.2-1. In Utah, the Millard County Deer Winter Range, managed by the Utah Division of Wildlife Resources, is aided by federal funds through the USFWS. Although access by the public is not restricted, development is prohibited. These areas, now administered by BLM, had been recommended for study as National Natural Landmarks.

3.0 TEXAS/NEW MEXICO REGION

3.1 WILDERNESS

One Congressionally Designated Wilderness and one wilderness study area are located in the New Mexico portion of the Texas/New Mexico study area. These are the USFWS-managed Salt Creek Wilderness, within the Bitter Lake National Wildlife Refuge, and the BLM-designated Sabinosa Wilderness Study Area (Figure 3.1-1).

3.2 SIGNIFICANT NATURAL AREAS

As in Nevada and Utah, various federal and state agencies in Texas and New Mexico have identified unique, undisturbed ecosystems and sites of geologic interest to be managed and preserved for their natural qualities. These are collectively termed "significant natural areas" and, with the inclusion of the USFS-managed National Grasslands, fall into the same categories as previously discussed in Section 2.2. Tables 3.2-1 and 3.2-2 list significant natural areas in Texas and New Mexico, their proposed or designated status, the managing agency, and their acreage. Figure 3.2-1 shows the locations of these areas.

As stated in Section 2.2, the National Natural Landmarks program was consolidated within the National Park Service in late spring 1981. Most recent information on the status of Natural Landmarks for this impact statement was supplied by the Heritage Conservation and Recreation Service (DOI) which formerly administered the National Natural Landmarks Program.

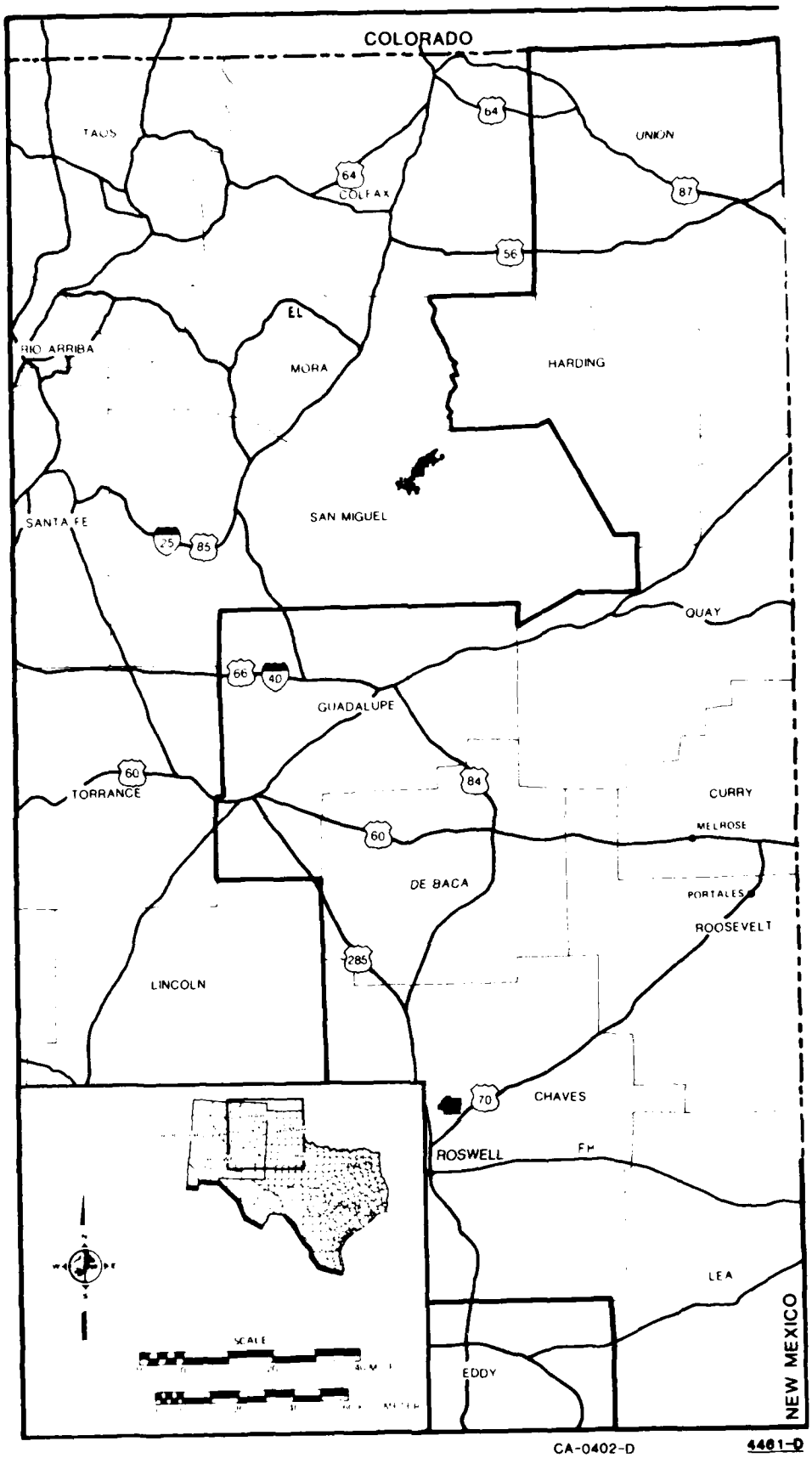
1. The High Plains Natural Area, within Buffalo Lake National Wildlife Refuge in Randall County, Texas, is a rolling prairie at an elevation of approximately 3,700 ft. As a natural community it significantly represents the grama-buffalo grass association.

2. Muleshoe National Wildlife Refuge of Bailey County, Texas, is outstanding for its more than 5,000 acres of short grasses, mesquite, and rangelands, its waterfowl, shorebirds, and the largest fall-winter concentration of little brown cranes in the United States. It is nationally significant as a seasonal haven for concentrations of waterfowl.

3. Palo Duro Canyon State Park in Armstrong and Randall counties, Texas, was formed by erosion of a fork of the Red River and contains cross-sectional views of sedimentary rock representing four geological periods and some Triassic and Pliocene vertebrate fossils.

4. The Bitter Lake Group, Chaves County, New Mexico, contains sinkhole depressions formed by solution of gypsum-bearing rocks and supports shrub-grassland vegetation representative of the northern Chihuahuan Desert.

5. Bueveros Shortgrass Plains, a Registered Landmark in Harding County, New Mexico, is an example of the blue grama-buffalo grass prairie of the Great Plains considered to be typical of the pre-cattle grazing era. Pronghorn and prairie dogs, two of the three dominant herbivores, are still in the area.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TORRANCE
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CURRY
MELROSE
DE BACA
PORTALES
ROOSEVELT
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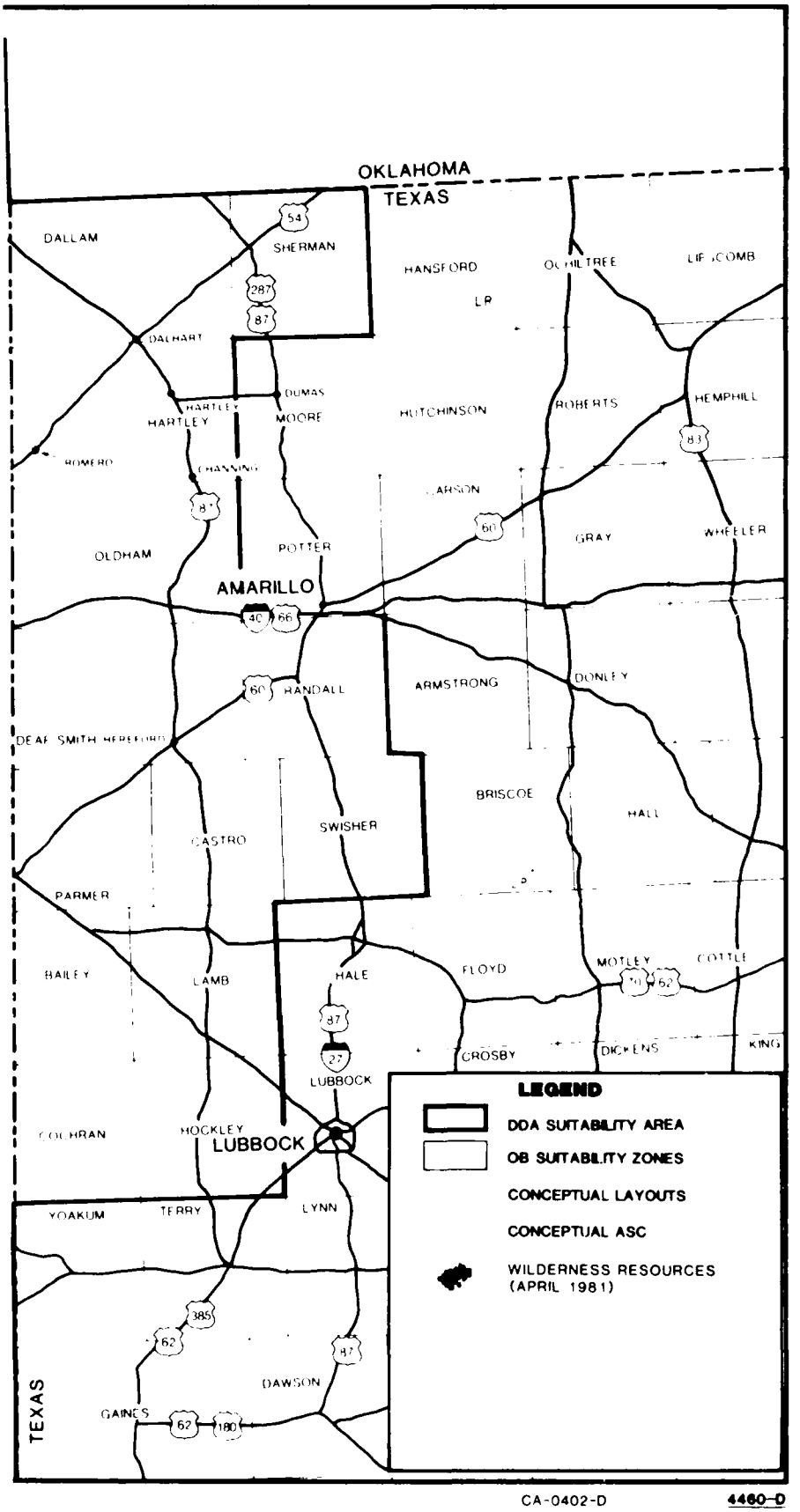

Figure 3.1-1. Wilderness resources in the Texas/New Mexico study area.

Table 3.2-1. Inventory of significant natural areas*, Texas study area.

Significant Natural Area	County	Acres	Managing Agency
National Natural Landmarks			
Designated			
High Plains Natural Area	Randall	175	USFWS
Muleshoe[3]	Bailey	5,650	USFWS
Palo Duro Canyon State Park[1]	Armstrong, Randall	16,465	State Parks and Wildlife
Potential			
Buffalo Springs	Dallam	364	Private
Refuges			
Buffalo Lake[3]	Randall	7,664	USFWS
Muleshoe[3]	Bailey	5,809	USFWS
Research Natural Areas			
High Plains[4]	Randall	320	USFWS
Areas of Critical Environmental Concern			
None			
Grasslands			
Rita Blanca National Grasslands	Dallam	70,000[5]	USFS

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*Areas listed are primarily those formally classified by federal or state managing agencies. Unclassified areas are not listed. Also not listed are areas for which recreation is a dominant use.

[1]Registered.

[2]In nominating process.

[3]National Wildlife Refuge.

[4]Within Buffalo Lake National Wildlife Refuge.

[5]An additional 200,000 acres is privately owned.

Table 3.2-2. Inventory of significant natural areas,* New Mexico study area (Page 1 of 2).

Significant Natural Area	County	Acres	Managing Agency
National Natural Landmarks			
Designated			
Bitter Lake Group	Chaves	10,090	USFWS
Bueyeros Shortgrass Plains[1]	Harding	322	Private
Potential			
Mescalero Escarpment	Quay	7,040	Private
Mescalero Sands[2]	Chaves	3,571	BLM, State
Vaughn	Guadalupe	80	Private
Refuges			
Bitter Lake[3]	Chaves	23,269	USFWS
Grulla[3]	Roosevelt	3,231	USFWS
Las Vegas[3]	San Miguel	8,239	USFWS
Maxwell[3]	Colfax	3,454	USFWS
Blackhills[5]	Roosevelt	1,320	State
Claudell[5]	Roosevelt	1,760	State
Crossroads[5]	Chaves	2,189	State
Gallena Wells Tracts[5]	Roosevelt	3,751	State
Liberty[5]	Roosevelt	626	State
Marshall[5]	Roosevelt	320	State

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Table 3.2-2. Inventory of significant natural areas,* New Mexico study area (Page 2 of 2).

Significant Natural Area	County	Acres	Managing Agency
Refuges (Continued)			
Milnesand[5]	Roosevelt	6,551	State
North Bluit[5]	Roosevelt	1,280	State
South Bluit[5]	Lea	640	State
Research Natural Areas			
Bitter Lake[4]	Chaves	300	USFWS
Inkpot[4]	Chaves	2	USFWS
Lake St. Francis[4]	Chaves	700	USFWS
Mathers	Chaves	362	BLM
Areas of Critical Environmental Concern			
None			
Grasslands			
Kiowa National Grasslands	Union, Harding, Mora	136,412	USFS

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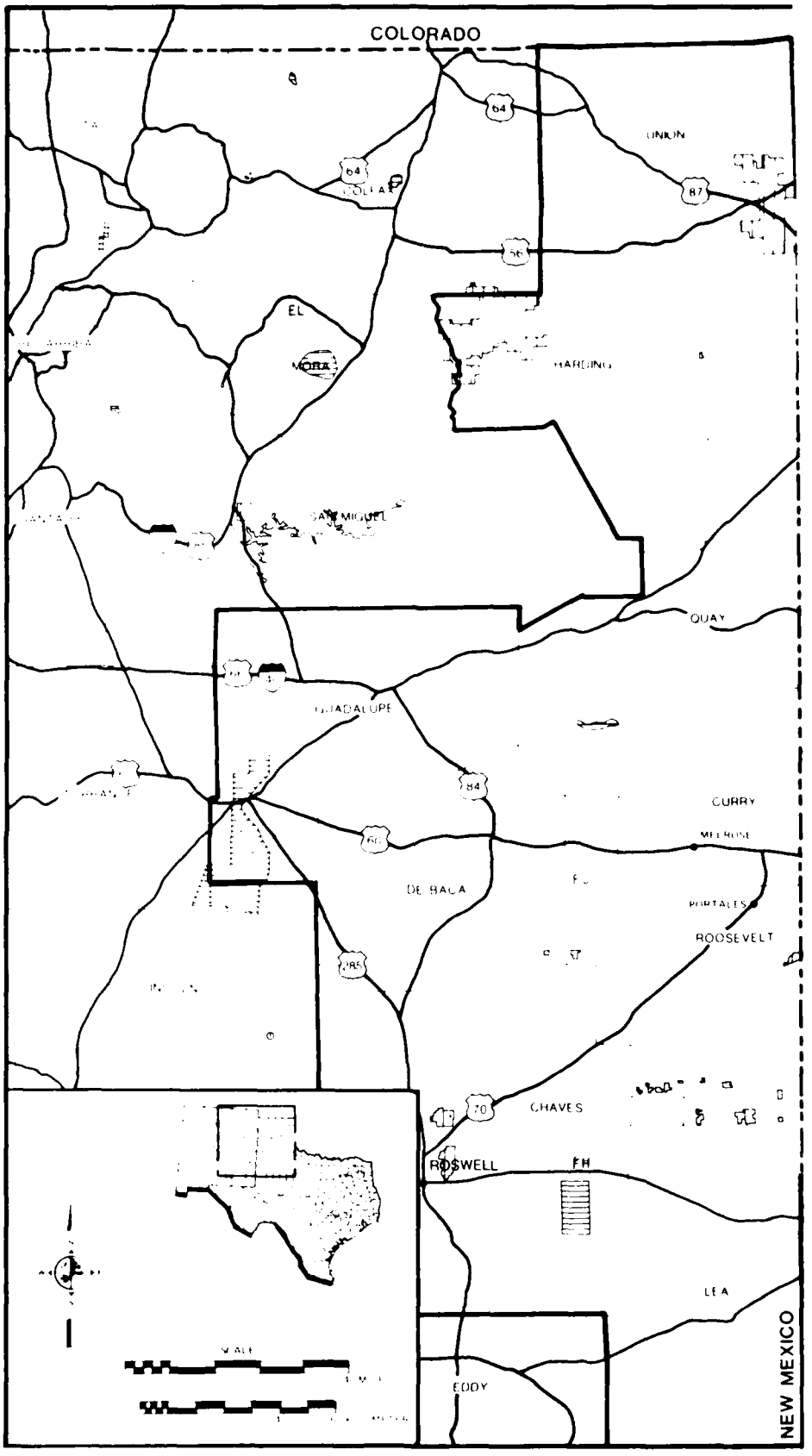
*Areas listed are primarily those formally classified by federal or state managing agencies. Unclassified areas, except where noted, are not listed. Also not listed are areas for which recreation is a dominant use.

[1]Registered.
[2]In nominating process.
[3]National Wildlife Refuge.
[4]Within Bitter Lake National Wildlife Refuge.
[5]Wildlife Management Area

In addition to the USFWS-managed National Wildlife Refuges, there are several Wildlife Management Areas acquired by New Mexico for the establishment of restoration areas for the lesser prairie chicken. Although state-managed, partial funding for these areas has come through the USFWS-administered Federal Aid Program. These areas, totalling approximately 20,000 acres, are listed in Table 3.2-2.

Within the four-state area studied for possible M-X deployment, only Texas and New Mexico contain National Grasslands. Rita Blanca National Grasslands in Texas, and Kiowa National Grasslands in New Mexico are both within the study area. National Grasslands are a part of the National Forest System and are permanently held by the Department of Agriculture for administration under principles of land conservation and multiple use. Generally, there are no restrictions to hiking or camping.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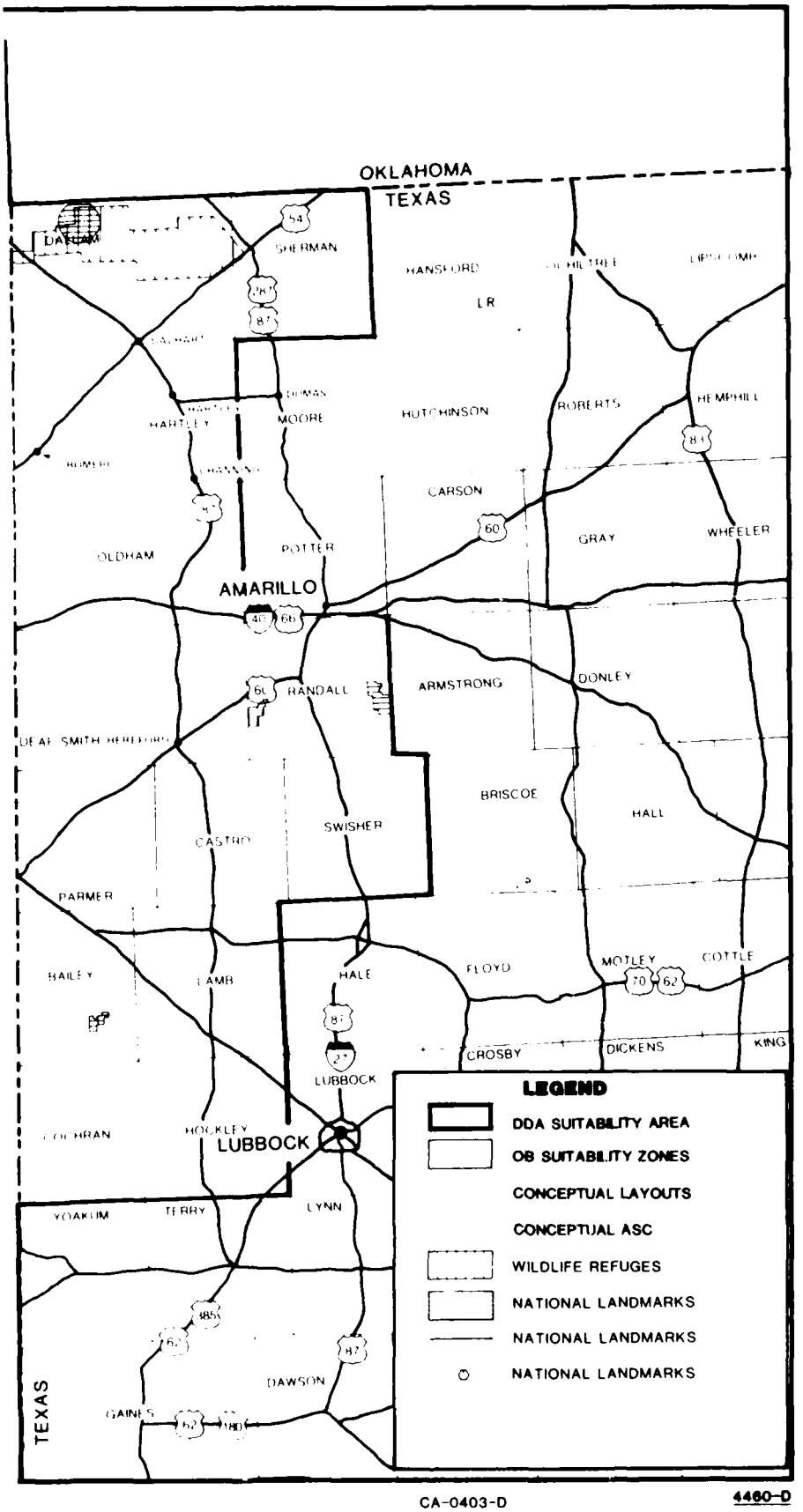

Figure 3.2-1. Significant natural areas in the Texas/New Mexico study area.

4.0 PRINCIPAL IMPACTS TO WILDERNESS

4.1 INTRODUCTION

Wilderness areas are generally established to protect the natural environments of plant and animal populations, preserve genetic resources contained in rare ecosystems, and serve as sources of baseline data on undisturbed ecosystems. In addition to preserving natural conditions, wilderness is intended to preserve outstanding opportunities for solitude by providing low density, backcountry recreational experiences (Irland, 1979). For areas classified under the Wilderness Act (1964) this is a legal requirement. Increasing demand coupled with limited opportunities for expansion of the supply has created conditions in many areas that make the preservation of "wilderness character" extremely difficult and threatens the preservation of both naturalness and solitude. A salient feature of the Great Basin region, identified in the SCOPING process (HDR, 1980), are the wide vistas imparting a sense of open space, the last frontier, and associated qualities--important descriptions and components of wilderness in the eyes of many, particularly of this region. M-X deployment with its attendant visual and noise intrusions, as well as increased numbers of people in an area that is now primarily wildland, is expected to diminish the biophysical resource values characteristic of the Great Basin wildlands.

Wilderness Act criteria were used in developing the impact analysis. The analysis was performed in three steps: (1) a description of project effects on the wilderness resource, (2) an assessment of the impact to the wildland resources, and (3) a determination of impact significance. Effects on wilderness ecosystem integrity and quality of experience were estimated by combining baseline information with project information and are summarized in Table 4.1-1. These effects result primarily from construction and recreation. Primary sources of impact include (1) alteration of scenic landscapes by construction of clusters and road networks, (2) increased noise levels during construction activities, (3) increased access to formerly remote areas, combined with (4) increased numbers of people during both construction and operation, and (5) ambient air quality deterioration. Localized effects of dust generation by construction vehicles and wind erosion of disturbed areas are discussed in ETR-13 (Atmospheric Resources).

The short-term effects of the project on wilderness resources would include construction-related noise and lowered air quality and dispersed use of recreational resources by the increased human population associated with the project. Once construction is completed, the presence of fenced structures, DTN (Designated Transportation Network), and cluster-road networks would permanently alter scenic vistas from nearby wilderness resource areas. This constitutes an irreversible long-term effect. Population-related effects on the ecological integrity and on the quality of the wilderness experience would be proportional to user-density and would be primarily a function of population centers associated with construction camps and operating bases (OBs). From the standpoint of population and site-permanence, the long-term, recreation-related impacts on the wilderness resource would appear to be greater for population centers associated with the OBs.

Siting clusters and road networks adjacent to prospective wilderness would increase access to, and hence opportunities for, enjoyment of our wilderness

Table 4.1-1. Summary of potential impacts to wilderness resources in the Nevada/Utah study area (Page 1 of 2).

Project Parameter	Secondary Effects	Potential Impacts to Wilderness Resources	References
Area disturbed	Construction		
Protective structure = 10 acres/shelter	Fugitive dust	Degradation in scenic vista quality - temporary loss in wilderness quality.	Merriam and Ammons, 1964; Krutilla, 1972; Hendee et al., 1978
	Erosion	No effects predicted	
	Loss of vegetation	Degradation in aesthetic quality. For those areas from which project construction is visible, there will be temporary loss in wilderness quality	Merriam and Ammons, 1964; Krutilla, 1972; Hendee et al., 1978
4,600 structures, full basing	Presence of people and machinery	Loss in aesthetic quality and increase in noise levels causing temporary loss in wilderness quality.	Merriam and Ammons, 1964; Krutilla, 1972; Hendee et al., 1978
2,300 structures, split basing	Operations		
	Fugitive dust	Degradation in scenic vista quality - temporary loss in wilderness quality.	Merriam and Ammons, 1964; Krutilla, 1972; Hendee et al., 1978
Roads = 100 ft wide 1,260-1,460 mi DTN, full basing; 730 mi DTN split basing; 5,940-6,200 mi cluster roads, full basing; 3,171 mi cluster roads, split basing	Erosion	No effects predicted.	
	Revegetation of disturbed areas	Reduction of fugitive dust leading to scenic vista improvement over time as revegetation occurs. Time scale will depend upon natural rate of revegetation and whether enhancement programs are implemented.	
Total = 160,365-172,375 acres			
	Transmission lines	For any built within view of areas, will be degradation in aesthetic quality, loss in wilderness quality	Merriam and Ammons, 1964; Krutilla, 1972; Hendee et al., 1978
Water use	Lowering of water table with potential loss of surface water in lowland areas which might be connected through connecting drainage systems	Potential for wilderness quality loss and aquatic habitat loss resulting in increased concentrations of people into pristine areas.	Dudley and Larson, 1976
Construction: full basing 86,000-136,000 acre-ft/yr total		Minimal effects expected.	
Vehicle traffic			
Construction	Fugitive dust	Degradation in scenic vista quality; temporary loss in wilderness quality.	Merriam and Ammons, 1964; Krutilla, 1972; Hendee et al., 1978.
Operations ASC to cluster = 4,000 trips/yr	Noise and visual	Degradation in wilderness quality for those areas through or near which vehicle traffic increases. Project data insufficient to predict specific locations.	Merriam and Ammons, 1964; Krutilla, 1972; Hendee et al., 1978.

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Table 4.1-1. Summary of potential impacts to wilderness resources in the Nevada/Utah study area (Page 2 of 2).

Project Parameter	Secondary Effects	Potential Impacts to Wilderness Resources	References
Security	Radar and microwave emissios	No effects predicted.	
	Noise and visual (e.g., helicopter and ground patrol)	Degradation in wilderness quality for areas through or near which security maneuvers are involved.	Merriam and Ammons, 1964; Krutilla, 1972; Hendee et al., 1978
		Project data insufficient to predict specific locations	
People	Sewage	No effects expected.	
	Solid waste	No effects expected.	
Construction	Introduction of exotic species	Data insufficient to predict effects.	
Direct labor =32,936 yr/peak, full basing; = 29,407 yr/peak split basing	Recreation	Degradation/loss of wilderness quality. Habitat destruction through vegetation removal and soil disturbance. Changes in animal behavior patterns due to habitat loss and increased noise levels. Increased noise and air pollution levels.	Utah Outdoor Recreation Agency, 1978. Altmann, 1956; McNamara, Berwick, & Hillyer, 1980; The Geological Society of America, 1977; Wilshire & Nakata, 1976; Wilshire et al., 1978a,b; Bury et al., 1977; Vollmer et al., 1976a,b; BLM, 1975; Bondello, 1980; Busak & Bury, 1974; San Diego State Univ. & Hubbs/Sea World Research Institution, 1978.
	Unauthorized ORV use		
Induced growth = 125,000 peak, full basing		Data insufficient to quantify effects or location.	
Operations direct labor + induced growth = 34,000 permanent residents.	Camping, hiking, etc.	Degradation/loss in wilderness quality due to trampling and crushing of vegetation. Trail erosion from increased use of area.	Irland, 1979; Settergren, 1977; McQuaid-Cook, 1978; Frissell & Duncan, 1965; Merriam & Smith 1974; Verburg, 1974.
		Alteration of animal populations.	McQuivey, 1978.
		Increased level of contact with cultural amenities.	Hendee et al., 1978.
		Increased use and missuse of resources.	Miller, 1980; Long, 1980; DeGraff, 1980.
During construction, people will be dispersed throughout deployment area.		Increased litter and sanitation problems, attraction of nuisance organisms.	
During operation, people and effects will be concentrated in the vicinity of operating bases.	Hunting, fishing, poaching	Wilderness quality degradation/loss since there exists the potential for decrease in populations, particularly in isolated areas with the anticipated increase in hunting and fishing pressures.	Curran, 1980; Parsons, 1980.

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heritage. However, such action would also reduce and compromise the desirable, unimpaired, primitive, and natural qualities associated with the wilderness resource. Although wilderness perception may vary with the user, in general, wilderness may be described as undeveloped, natural country, of difficult access (at least 3 mi from the nearest development) and usually with few people (Merriam & Ammons, 1964). According to Lucas (1980) the primary factors affecting wilderness experience satisfaction are (1) scenic and beauty including the wild natural quality of the land, and (2) the opportunity for solitude, with crowding as a negative influence. Where there are encroaching clusters and associated structures, the actual impact zone would be expanded since such proximity would have the potential to diminish the solitude opportunity of the wilderness experience within those wilderness resources.

Public comments reflect these concerns:

PUBLIC COMMENTS ON THE DRAFT EIS:

"The MX will not be deployed in designated or potential wilderness areas yet doesn't plan to eliminate such factors as noise and air pollution which will mar the primitive and natural aspect of wilderness. Vistas of the wilderness would include M-X roads and structures. Personnel seeking recreation would destroy the solitude of these areas, and M-X roads would increase population access." (A-0258-3-021)

"In addition to claiming resources that will be needed to develop our domestic, peace-time industry, the M-X would destroy the natural integrity of the remotest parts of the Basin and Range country where a man might like to go for discovery or just peace of mind." (A0411-8-006)

"Some proposed sites lie near existing and potential wilderness areas. If M-X is built, these areas may have lowered scenic and solitary values as wilderness areas." (B0164-2-333)

"Many potential wilderness units are virtually devoid of economic resources, yet they afford extraordinary values of solitude, scenery, and demanding primitive travel, camping, and hunting. Due to the low human presence in most of the valleys (which M-X would alter permanently), the contrasts between de facto wilderness, semi-wilderness lands, and the grazed and inhabited valleys is rarely jarring or discordant." (A0475-3-006)

"The M-X project, no matter how well thought out and/or implemented, will do many irreversible things to the area it is planned for. Building roads to and for the sites will bring ready access to now remote places. This in itself will destroy some of the natural beauty and appeal of these areas . . . its own wildness." (A0755-8-002)

Calculations based on information provided in ETR-10, "Noise," show that typical noise intrusion levels during various stages of construction (e.g. ground clearing, excavation, and erection) are less than 110 decibels on the A scale (dBA). Assuming construction activities to be relatively contained and these noise levels to be approaching a "point source" (as opposed to having multiple source sounds), under normal atmospheric conditions sounds of 110 dBA would attenuate to 35 dBA in

about 1,600 meters (1 mi). This compares, for example, to the threshold of audibility in humans (0 dBA), a freeway (80 dBA) and the threshold of pain (100-120 dBA) (CEQ Annual Report, 1979). A busy freeway constituting a line source of noise at 75 dBA would have its noise attenuated to 35 dBA at 2,600 meters (1.6 mi). Line or multiple source sounds attenuate at a slower rate than do those emanating from a point source.

Normal ambient sound levels in wilderness areas are of the order of 35 decibels according to the EPA (1978). However, HDR field observations report "natural" sound levels (Leq) of 43.5 ± 3.2 dBA and 50.7 ± 4.9 dBA for the proposed Coyote Spring and Beryl-Milford OB sites, respectively. Equivalent sound level (Leq) is defined as the sound level averaged on a power basis over a specified time period (3 minutes). The discrepancy between these findings and those reported by the EPA (1978) may be attributed largely to consistent high winds (5-12 mph) in the vicinity of the proposed OB zones as well as background noise from Highway 93. Presumably wilderness resources within the vicinity of these sites would have similar noise levels.

The quality of noise, however, is important since a bird may not seem "intrusive" to wilderness users while a distant bulldozer might (Schiff, 1981). Characteristic of the Great Basin region are the distances at which such integrated sounds may be perceived. HDR field observations in Coyote Spring indicate that traffic noise from Highway 93 can be heard up to 4.1 mi away. The 35 dBA level for noise attenuation distance was used in this analysis since it is the level below which differences in the quality of sounds are difficult for many to perceive (Schiff, 1981), although evaluations of worst case noise intrusions must include a subjective statement of long-range effects as experienced in Coyote Spring Valley (above).

The 30 dBA contour under worst case noise exposure is forecast to extend 16 to 19 kilometers (10 to 12 mi) from either end of airport runways connected with operating bases. The area within this contour decreases from a width of about 8 kilometers (5 mi) near the airport to a point 10 to 12 mi away (ETR-10).

4.2 METHODOLOGY

WILDERNESS RESOURCE DATA BASE (4.2.1)

Source materials for the wilderness resource computer data base included:

1:125,000 scale November 1980 BLM Wilderness Inventory Maps (Nevada)

1:500,000 scale November 1980 BLM Wilderness Inventory Maps (Utah, New Mexico)

1:1,000,000 scale April 1979 maps of USFS RARE II Wilderness Recommendations (Nevada, Utah, New Mexico)

1:1,000,000 scale USFWS map of the Salt Creek Wilderness (New Mexico)

For Nevada, BLM, NPS, and USFWS resource areas UTM (universal transverse mercator) tic marks were superimposed onto the 1:125,000 BLM maps. Resource polygons were then digitized into the computer from these maps using the UTM

coordinate system. Nevada and Utah USFS RARE II Wilderness Recommendations and Further Planning Unit polygons were hand transferred from the 1:1,000,000 scale USFS maps onto 1:250,000 scale USGS topographic sheets. Utah and New Mexico BLM and NPS (Utah) wilderness resource polygons were hand-transferred from the 1:500,000 scale BLM maps onto the 1:250,000 USGS topo sheets as was the USFS Salt Creek Wilderness. All transfers to the USGS topo sheets were as a result of original managing agency source maps having no UTM coordinates. Once transferred, the resource polygons were digitized into the computer from the USGS 1:250,000 topographic sheets using the UTM coordinate system.

RESOURCE ABUNDANCE AND NOISE IMPACT ANALYSIS (4.2.2)

Digitized data maps including hydrologic subunit boundaries, wilderness resource area boundaries, and project feature locations were input to a computerized map analysis package--MAP (Tomlin et al., 1979). The program allows the data maps to be manipulated as variables in a spatial, cell-based configuration with the data for each map referenced to the center of each (1 km by 1 km) cell. Subsequent arithmetic (multiply, differentiate, etc.) and combinative (cross tabulate, clump, cover, etc.) operations can be performed on respective cells of one or more maps depending on the designated operation.

MAP operations can be organized (using FORTRAN) to issue a series of commands which manipulate the data. Equations using this command structure model allows evaluation of the input data stored in relation to the centroid of each cell in the mapped area. Fast processing (a few seconds) of the cell-based data maps generates an output which provides evaluations of spatial relationships according to the set-up of the command structure model. The values assigned to each cell after processing can range from 1 to 100 and can be printed out using overprint capabilities on a line printer or can be output as shaded polygons on a plotter.

For determination of resource abundance, maps containing the spatial relationships between hydrologic subunits and wilderness resource areas were input to MAP and a cross-tabulation operation performed. The resultant output indicates the percentage of each wilderness resource area contained within each hydrologic subunit.

A prerequisite for the determination of potential impacts resulting from acute construction noise and increased access involved identification of wilderness resources within 1, 3, and 6 mi, respectively, of a project feature. Normal ambient sound levels in wilderness areas are of the order of 35 decibels, according to the EPA (1978). Under normal atmospheric conditions, typical construction noise levels of 115 dBA or less attenuate to 35 dBA in about 1,600 meters (1 mi) (ETR-10 "Noise"). The 3 mi limit for many wilderness users defines the boundaries of quality experience. Although wilderness perception may vary with the user, generally wilderness may be described as undeveloped, natural country, of difficult access at least 3 mi from the nearest development (Merriam and Ammons, 1964). The 6 mi zone was incorporated into this analysis to include perceptible but more extensive project-related noise effects since the current BLM procedure for determining a threshold at which external audible and visual effects compromise wilderness quality is still performed subjectively by BLM personnel (Harmon, 1980).

To obtain these data, a step involving the designation of masking zones (areas within 2 km (1.2 mi), 5 km (3 mi), and 10 km (6 mi) from the nearest project element) was incorporated into the MAP. The previously described cross-tabulation process was subsequently conducted for the zoned areas with the resultant output listing the percent of each wilderness resource area lying within each of the above described contours for each hydrologic subunit. The results are summarized in Table 4.3-1.

Using the data obtained from the MAP output, each wilderness resource area was assigned a noise impact value of 3 (high potential impact) if any portion of it occurred within the 1 to 3 mi contours of a project element; a 1 (low potential impact) if any portion occurred more than 3 mi but less than 6 mi from a proposed project element; and a 0 (no potential impact) if 100 percent of the wilderness occurred more than 6 mi from the nearest project feature.

Then, for each hydrologic subunit, the initial values were summed for all wilderness resource areas which were either partly or wholly contained within that hydrologic subunit. For example, Fish Springs Valley includes portions of three wilderness resource areas each of which had been assigned a noise impact value of three. These assigned values were summed together to give an overall combined subunit value of nine. This combined noise impact grade indicated the relative level of impact. The categorization of hydrologic subunits as having low, moderate, high, or no potential noise related effects was based upon: (a) distance from the potential source for all wilderness resources in the subunit; (b) noise attenuation determination (ETR-10, Noise); and (c) a natural aggregation of noise-related scores from Table 4.3-1 information into three groups chacterized as high, moderate, low, or none when plotted in a histogram (the impact determination process for noise-related effects is illustrated in Figure 4.2.2-1).

VISUAL IMPACT ANALYSIS (4.2.3)

In order to arrive at a means of assessing the potential visual impact of the M-X road network on the characteristic sweeping vistas of valley floors from montane wilderness resource areas, the following analysis was performed. Using September 1980 USGS 1:250,000 scale topographic sheets overlaid with a computer generated DDA hydrologic subunit map, a line was drawn on the long axis of each valley, and perpendicular to this axis in the subunit at midpoint. A road intercept count for each hydrologic subunit without the project superimposed was tabulated as baseline data. The USGS baseline map was then overlaid with a 1:250,000 scale map of the conceptualized project system for the DDA and the number of road intercept again tabulated. The percent increase in number of road intercepts over baseline was calculated. The measurement was unbiased, the selection not being based upon the distribution of clusters or the view of the author but rather upon the shape and dimensions of each valley. The analysis presumes to quantitatively describe the proportionate increase in road intercepts visible from wilderness units adjacent to the valley floors in lieu of visiting all of the vantage points at each site to assess field of view as influenced by vegetative and topographic screening. The qualitative aspects of a grid-like linear patterning of project roads are not incorporated into this analysis. The results are summarized in Table 4.3-1.

To evaluate on a hydrologic subunit basis potential visual impacts to regional wilderness resources, the following procedure was employed. A hydrologic subunit

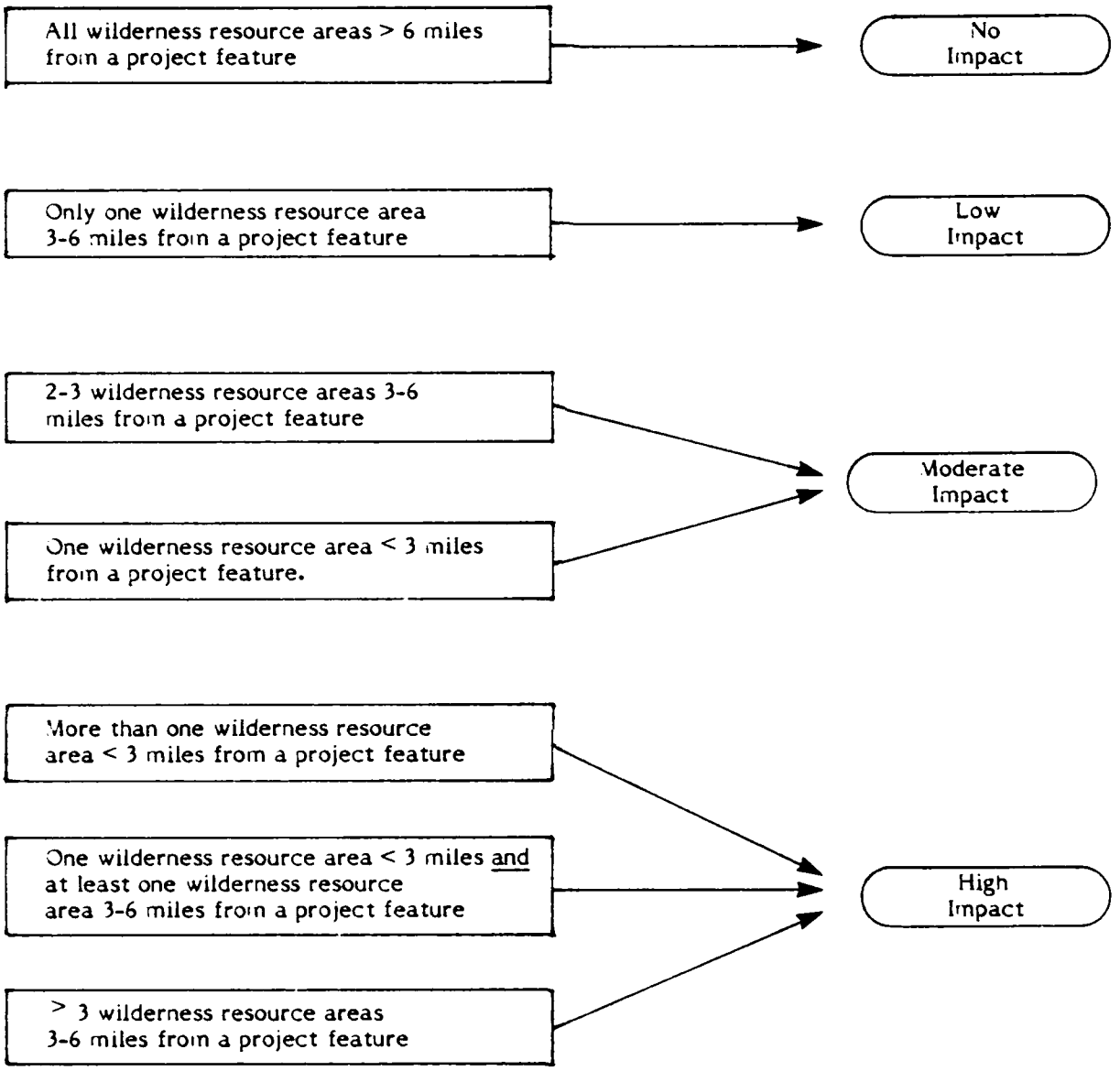

Figure 4.2.2-1. Determination of noise impact on hydrologic subunits.

was assigned a value of 1 (low impact potential) if the percent increase in road intercepts resulting from M-X were less than 10 percent. The 10 percent figure was chosen because of the unknown perceptual variance due to vegetation and topographic screening and since it is within the realm of possible error of analysis or observation. Likewise, due to the potentially pervasive visual impact of the project on "de facto" wilderness, a value of 1 (low potential impact) was accorded subunits presently containing no legally defined wilderness resource areas. Hydrologic subunits containing an OB or having a greater than 10 percent increase in road intercepts were assigned a value of 3 (high potential impact). This initial subunit grade was multiplied by the number of wilderness resources within the subunit to determine on a hydrologic subunit basis the potential for project-related visual effects on vicinity wilderness resource areas. (The impact determination process for visual-related effects is illustrated in Figure 4.2.3-1.)

INCREASED ACCESS IMPACT ANALYSIS (4.2.4)

In order to determine the potential impact of the increased access resulting from the proposed M-X road network to wilderness resources, the following analysis was performed. Wilderness resources and hydrologic subunits were computer plotted on a USGS topographic map at a 1:500,000 scale. The number of existing road access points within 3 mi of each wilderness resource area was tabulated for the baseline resource access determination. Three miles constitutes the distance from man-made features that many wilderness users feel is minimal to their wilderness experience (Merriam and Ammons, 1964). It is also the distance a fast walker can cover in an hour's hike making the resource vulnerable to short day-trips.

Similar distance calculations were tabulated by the M-X DIST computer program for the study area wilderness resources with the conceptual M-X system layout (including DTN). This program normalized UTM data retrieved from the geographic data base to meters. The distance between two types of data (e.g., resource and spur roads) represented as (X_O, Y_O), (X_1, Y_1) was determined by

$$\text{Distance} = \sqrt{(X_O - X_1)^2 + (Y_O - Y_1)^2}$$

The distance in meters was then transformed to miles. Since the calculations were only made to digitized points with no interpolation performed, the distance to a given wilderness resource was determined by the distance to the nearest digitized point defining that area. Also, distance calculations by hand were made for those areas where UTM zones were crossed. The results are summarized in Table 4.3-1.

For each wilderness resource area, a value of 0 was assigned if no M-X related access points occurred within 3 mi; a value of 1 was assigned to wilderness resource areas that would have 1 to 10 additional access points within 3 mi as a result of M-X; and a value of 3 was assigned to areas where more than 10 access points would occur within 3 mi due to M-X deployment. For this analysis the number of increased access points rather than percent increase over baseline was used since road access points are not subject to interpretation as are impacts related to perception (Section 4.2.3). The 1 - 10 figure was chosen since it is within the realm of possible analysis error and also to accommodate the uncertainty factor in population dispersion.

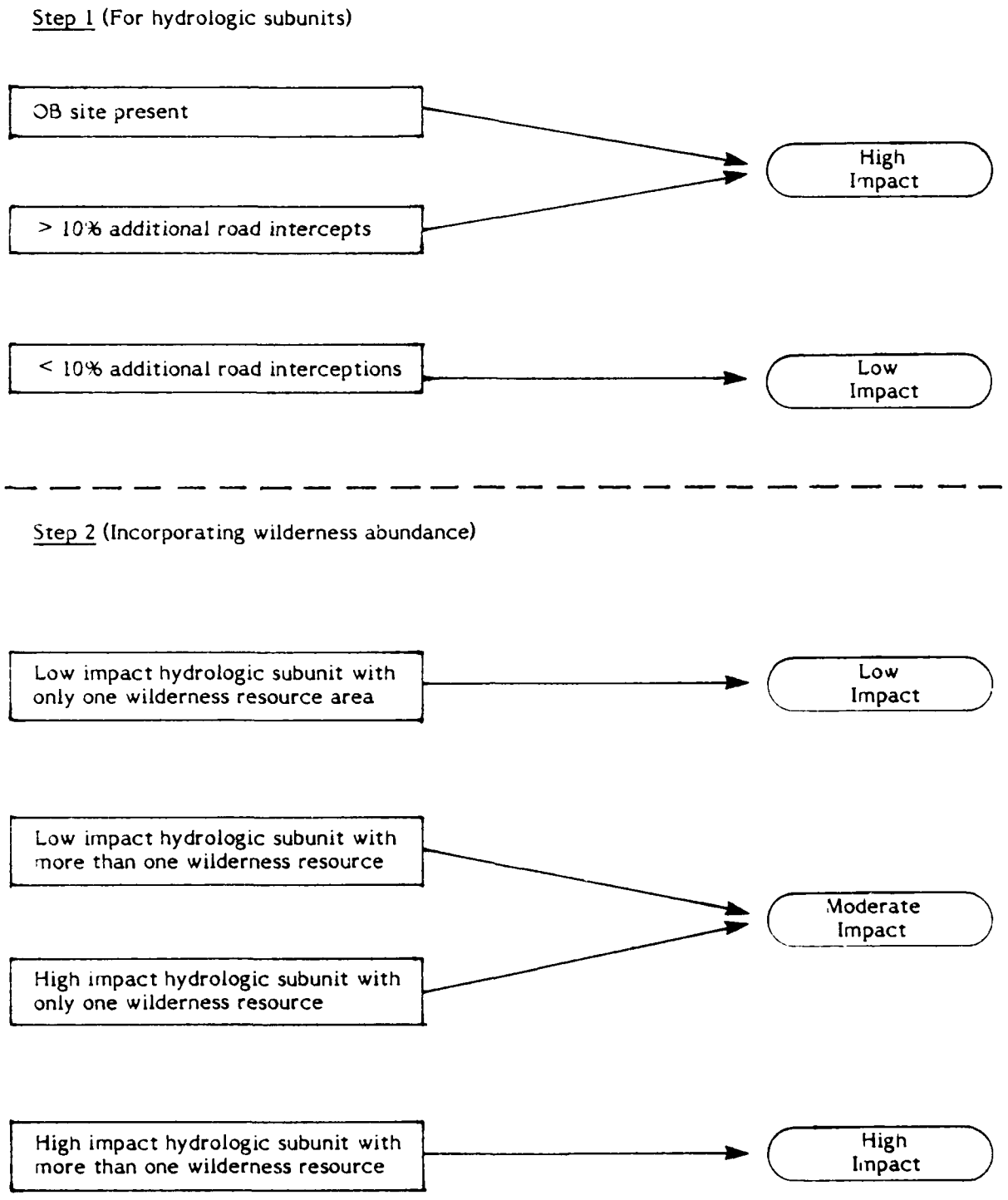

Figure 4.2.3-1. Determination of visual impact upon hydrologic subunits.

Each hydrologic subunit was assigned a numerical value to reflect the relative amount of increased access. This value was used in computing the indirect effects index (Section 4.2.5). The process for determination of increased access effects on a hydrologic subunit basis is illustrated in Figure 4.2.4-1.

INDIRECT EFFECTS ANALYSIS (4.2.5)

Because many of the indirect effects of the project will result from recreational activity, it is necessary to predict levels of wilderness recreation that would result from the in-migrants responding to M-X construction and operation needs. To this end, a model was developed (ETR-30) that predicts the recreational use of developed recreational areas (campsites, lakes, picnic areas), undeveloped areas where water can be found, as well as for wilderness resources. The model predicts use of these areas on the basis of travel time and the opportunities available at the sites.

Only camping, swimming, fishing, picnicking, off-road-vehicle (ORV) use, hiking, boating, and water skiing are considered. Hunting and snowskiing are not addressed because these activities do not follow gravity model assumptions. The area of interest encompasses the entire states of Nevada and Utah, and portions of Texas and New Mexico. Certain wilderness recreation opportunities such as solitude, nature study, mountain climbing, etc., do not show in the analysis since it is assumed that these activities are a small fraction of the total potential recreational activities and would thus pose fewer indirect effects than, for example, camping. Since camping and hiking are requisite activities of nearly all wilderness use, people are apportioned by these major categories.

The model provides predictions in space and time of recreation in Nevada, Utah, Texas, and New Mexico. Recreational use is based upon baseline and M-X population growth projections distributed among all communities, operating bases and construction camps in the impacted states. Two baseline population projections are used: trend baseline which projects normal population growth and high baseline which projects normal population growth plus expected growth from other projects planned for the region (ETR-37). Yearly recreational use is simulated for the years 1982 to 1994.

The basic assumptions of the model are these: (1) all other things being equal, use of a recreation area tends to decrease with travel time from a given population center. (2) Current inventories of features in wilderness resource areas (Table 4.4.1-3) reflect a spectrum of wilderness recreation opportunities which are assessed in the model. (3) The distance people are willing to travel for recreation can vary with location, i.e., people in Nevada may be willing to travel farther than those in Utah for a comparable activity. These differences are explicitly defined in the model.

The model is:

$$A_{tp} = QR_{tp} \qquad (1)$$

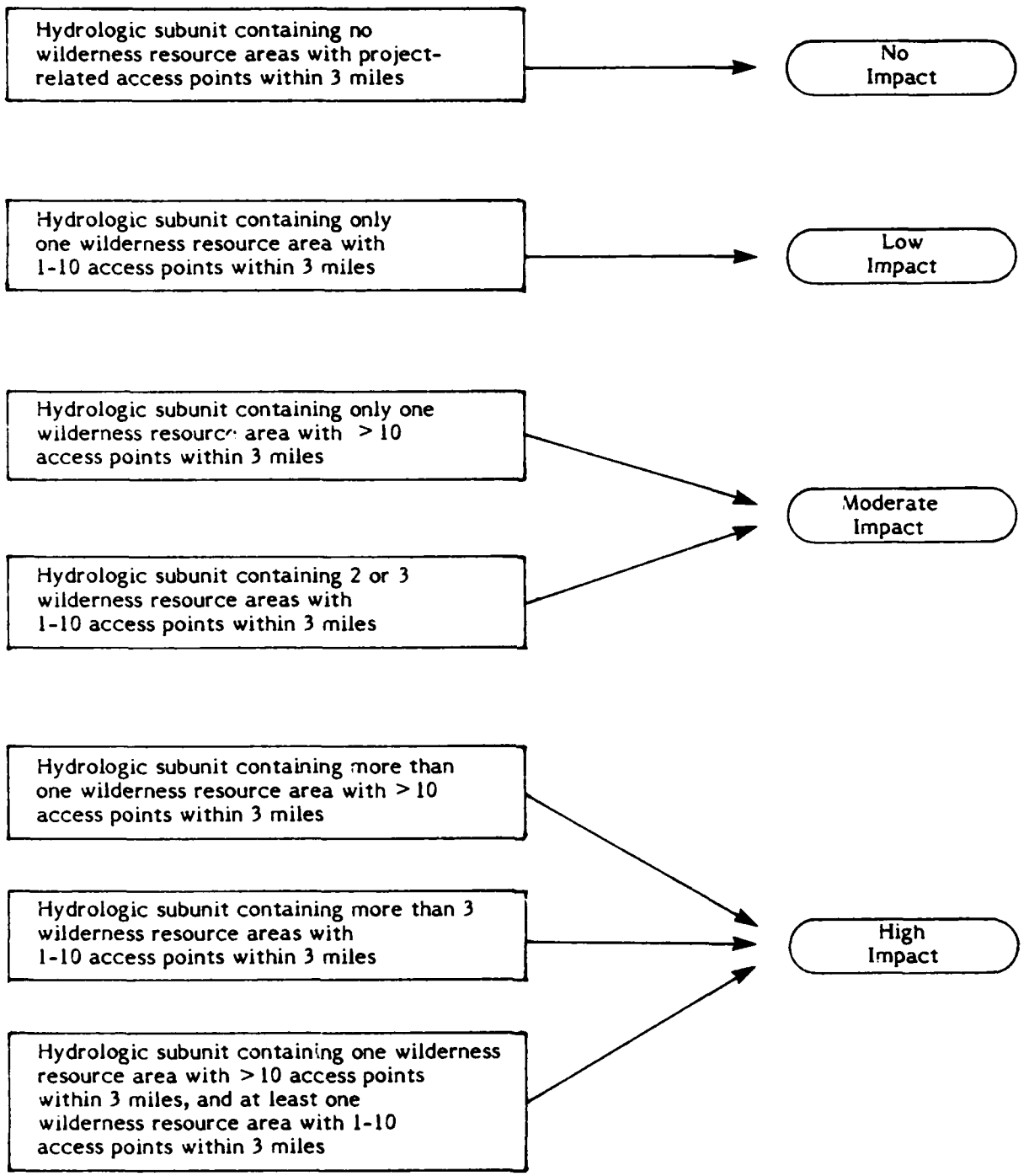

Figure 4.2.4-1. Determination of increased access impact upon hydrologic subunits. 4849-A

where,

A_{tp} = vector of use (visitor days) of recreation area i at time t and population level p

Q = matrix of the fraction of population from the j^{th} population center traveling to area i

R_{tp} = vector of visitor-days available in population center j at time t and population level p.

The dimensions of A are 4 population levels by 12 years by 983 areas; Q is defined for 983 areas by 92 population centers; R is defined for 4 population levels, 12 years and 92 population centers.

The matrix Q is developed by computing the probability of travel from population center j to area i as a function of travel time multiplied by a weighting factor that takes available resources and current use data into account for relative appeal of the recreation area. Refer to ETR-30 for details.

Equation (1) distributes all the available visitor days from each population center j among all the available recreation areas i since

$$a_i = \sum_j q_{ij} r_j \tag{2}$$

and

$$\sum_j q_{ij} = 1. \tag{3}$$

The reader is referred to ETR-30 for a complete discussion of the model, its derivation and testing.

The model was calibrated by iteratively comparing predictions of visitor use data to observations of visitor use data from more than 500 sites. The model accounted for 99 percent of the variance in the observed data. The residuals were normally distributed about 0, with a high degree of Kurtosis (ETR-30, Indirect Effects Model Documentation).

Limitations of the model include (1) an assumption that willingness to travel is invariant with respect to each activity considered, (2) use of commercial areas is omitted, (3) recreation is modeled on a yearly basis and therefore cannot be used to project peak use during holiday periods.

The metric of interest is the increase of use over projected baseline:

$$A_t = A_{t+mx} - A_t \tag{4}$$

and

$$A_h = A_{h+mx} - A_h \tag{5}$$

where

ΔA_t = increase of use over trend population due to M-X in-migration.

and ΔA_h = increase of use over high population baseline due to M-X in-migration.

In order to determine the potential impact of increased recreational pressures in Nevada/Utah wilderness resources a "user index" (number of visitor-days) and "crowding index" (number of visitor days per acre of resource) derived from the indirect effects model (ETR-30) were combined with the access index in order to arrive at a population-related "indirect effect index." A visitor-day is defined as the number of people visiting an area in any one twelve-hour time period (e.g., one person for twelve hours or two people for six hours, etc.). The indirect effect index is not a prediction of the actual level of impact on any one wilderness resource area such as those involving trail-head and campsite over-crowding, vegetation loss, and erosion by trampling, poaching, etc. These would be site-specific and will be analyzed for subsequent tiered decisionmaking.

The indirect effects model does not specifically predict wilderness use. Its capability of projecting dispersion for the related activities of camping, hiking, and fishing, however, was used to estimate the relative use of the various wilderness resource areas. Because the model was based on variables that would disperse people from population centers to recreation sites throughout the project area with wilderness recreation a subset of camping and hiking activities, a calibration factor was calculated specifically to incorporate motivations unique to wilderness use, such as solitude, nature observation, mountain climbing, etc. This calibration factor was calculated by taking the ratio between peak year (1987) trend growth population numbers (ETR-2) predicted to visit wilderness resources (Ludeman, 1980) to the number of people estimated by the indirect effects model to visit 75 backcountry areas within the DDA (ETR-30). The conversion of visitor-days to people assumes an average wilderness visitation of 3 days duration (Biddulph, 1981; McElwain, 1981; Dunn, 1981). The calibration factor multiplied by visitor-days/average visit provides a crowding index estimation calibrated for the wilderness resources. However, since the dispersion model estimates that approximately 50 percent of the total population would recreate outside of the region and that this figure is partially offset by the in-migration of approximately 30 percent non-resident recreationists (Lucas, 1980), 20 percent (0.6) was subtracted from the calibration factor prior to calculating the crowding index.

The estimated wilderness use is approximately twice the amount of total use that the model disperses to wilderness resource areas on the basis of camping, hiking, and fishing opportunities. Therefore, the model has been used to project the use of wilderness resource areas by multiplying the projection based on camping, hiking, and fishing by a factor of two.

The system used in determining the indirect effects for each wilderness resource involved assigning a score of 1 (low) to areas with a user index of 1 to 5 percent and a crowding index of less than 0.1 visitor days per acre; a score of 2 (moderate) to areas with a user index of 5 to 15 percent and a crowding index of 0.1 to 0.4 visitor days per acre; a score of 3 (high) to areas with a user index greater than 15 percent and a crowding index of greater than 0.4 visitor days per acre. These scores were combined with the access index to obtain a total indirect effects

grade for each wilderness resource. The indirect effect indices of the wilderness resource areas in each watershed were averaged to obtain an indirect effects index for the watershed. The categorization into low, moderate, high, or no potential effect was based on a natural aggregation of numerical values when plotted in a histogram. The impact determination process for people-related effects is illustrated in Figure 4.2.5-1. It should be noted, however, that these are conservative impact predictions since (1) possible increases in the proportion of the population who will be using wilderness resources is not taken into account; and (2) the 0.4 visitor days per acre crowding index cutoff for high impact is a result of data from a well-watered heterogeneous area in the High Uintas (Stankey, 1973) as compared to the majority of the arid Great Basin wilderness resources which would tend to concentrate people. It is difficult to determine the probability of impact underprediction given the paucity of baseline user information. However, the potential for underprediction does exist.

RESOURCE ATTRIBUTE ANALYSIS (4.2.6)

In order to determine which wilderness resources contain fragile or unique features such as threatened and/or endangered flora and/or fauna, rare or exceptional wildlife, as well as archaeological and historical sites, a computerized cross tabulation was performed using the Map Analysis Package (Tomlin et al., 1979) discussed previously under Section 4.2.2, Resource Abundance and Noise. For this particular analysis, digitized wilderness resource areas, pronghorn, mule deer, and bighorn range/key habitat, as well as locations of endangered aquatic species, rare plants, sage grouse, bald eagle wintering areas, and archaeological/historic sites were transferred from the HDR data base into a cell-based grid format for manipulation by MAP. The co-occurrence of wilderness resources with the above listed ecological features is indicated in Table 4.4.1-3.

COMPARISON OF ALTERNATIVES (4.2.7)

The method used for the ordinal ranking of alternatives was based on a non-parametric statistical scheme known as the Kendall's Tau Correlation Analysis (Dixon and Brown, 1977). This scheme computes the correlation for pairs of baseline/impact indices for the hydrologic subunits within each alternative as follows:

Each subunit containing wilderness resource areas was assigned a baseline indirect effect index and a potential indirect effect index. Baseline values were determined from managing agency visitor-use and crowding estimates along with access data as measured from USGS 1:500,000 scale topocomposites (see Section 4.2.4, Increased Access Analysis). The baseline values were subsequently ranked by means of the methodology used for obtaining the indirect effects index (Section 4.2.5): the mean of the combined access, use, and crowding indices for all wilderness resources within each subunit was calculated and assigned an index value of 1 and 3 for low and moderate baseline, respectively.

Kendall's Tau Correlation (t_b) coefficients based on the ranked baseline/impact index pairs and not on observed values were calculated as follows:

$$t_b = \frac{P - Q}{N(N-1)}$$

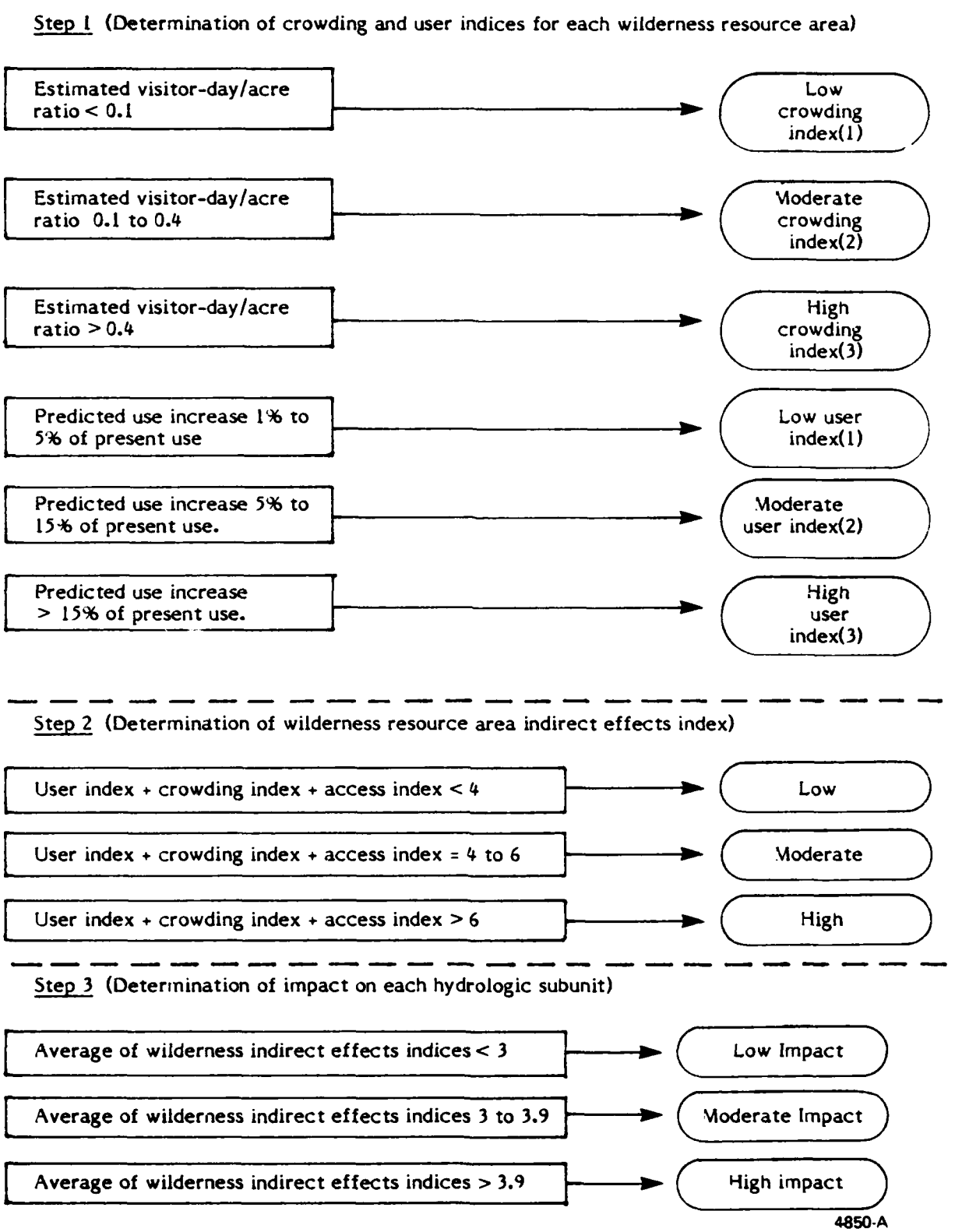

Figure 4.2.5-1. Determination of indirect effects impact on hydrologic subunits.

where:

P = twice the number of pairs of rankings such that both $r_j > r_l$ and $s_j > s_l$

Q = twice the number of pairs of rankings such that both $r_j > r_l$ and $s_j < s_l$

r_n = the ranks of the values of one variable (i.e., impact)

s_u = the ranks of the values of the second variable (i.e., baseline)

and N = the number of observations (i.e., hydrologic subunits containing wilderness resources).

The result is a rank correlation coefficient for each alternative, the relationship being: the higher the coefficient, the less the potential impact (i.e., the less the deviation from baseline figures).

4.3 DATA BASE

The data base upon which the impact analysis for visual, noise, increased access, and population-related effects on the wilderness resource was performed are tabulated in Table 4.3-1 (construction-related data base for determination of impacts on wilderness quality) and in Tables 4.3-2 through 4.3-9.

4.4 PROPOSED ACTION

DDA IMPACTS (4.4.1)

Full deployment in Nevada and Utah will mean the construction or upgrading of about 8,500 mi of road and the importation of about 125,000 people/workers, their families, associated merchants, and others by the 1987 peak year (ETR-2). Valley floor scarification by cluster and road networks with the resultant increased access for an increased population would have the potential to impinge on the Great Basin wilderness resources. Figure 4.4.1-1 illustrates the resource and project overlap.

According to the conceptual layout for the Proposed Action depicted in Figure 4.4.1-1, there are direct shelter conflicts with the Worthington Mountains WSA in the Penoyer and Garden hydrologic subunits (Nevada). All wilderness resource areas including WSAs are legal exclusion areas for development according to the Wilderness Act (1964) and the Federal Land Policy and Management Act (1976). It is Air Force policy to avoid siting in these areas. This particular WSA had been recommended to be dropped from further wilderness consideration by the BLM (April, 1980) when the conceptual layout was generated and was thus not excluded during the initial screening process. This conflict will necessarily be resolved in a later Tier before construction begins on the subject clusters. Either (1) the system layout would be altered such that the cluster siting would not impinge upon the wilderness resource area, or (2) the Congress would resolve the conflict by authorizing the Air Force to withdraw the land for M-X deployment.

Table 4.3-1. Construction-related data base for determination of impacts on wilderness quality (Page 1 of 4).

Hydrologic Subunit No.	Hydrologic Subunit Name	Wilderness Resource Name	Percent Subunit Road Intersection Increase As a Result of M-X Construction	Approximate WRA[1] Within 1 Mi of Project Element Acres (Percent)		Approximate WRA Within 3 Mi of Project Element Acres (Percent)		Approximate WRA Within 6 Mi of Project Element Acres (Percent)		Increase in Number of Access Points Within 3 Mi Due to M-X Construction
4	Snake, Nev./Utah	Deep Creek Mountains		4,824	(7)	17,917	(26)	31,010	(45)	35
		Fish Springs Range		1,575	(3)	7,350	(14)	10,500	(20)	31
		Granite Spring		1,872	(8)	7,956	(34)	17,550	(75)	25
		Conger Mountain		1,829	(8)	9,602	(42)	11,889	(52)	41
		Mount Moriah		1,944	(2)	15,553	(16)	45,686	(47)	19
		Wheeler Peak		0		0		0		4
		Highland Ridge		0		0		0		15
		King Top		4,239	(5)	16,954	(20)	31,365	(37)	34
		Wah Wah Mountains		700	(2)	2,450	(7)	2,450	(7)	42
		Total	108	16,983		77,782		150,450		
5	Pine, Utah	Mountain Home Range		0		0		0		23
		Central Wah Wah Range		0		0		0		31
		Wah Wah Mountains		700	(2)	6,650	(19)	11,900	(34)	42
		Total	153	700		6,650		11,900		
6	White, Utah	King Top		3,391	(4)	13,563	(16)	40,690	(48)	34
		Notch Peak		0		2,045	(4)	11,760	(23)	24
		Conger Mountain		1,372	(6)	3,658	(16)	10,974	(48)	41
		Howell Peak		0		0		7,624	(32)	0
		Swasey Mountain		1,980	(4)	6,930	(14)	17,820	(36)	53
		Fish Springs Range		2,100	(4)	7,350	(14)	11,550	(22)	31
		Total	86	8,843		33,546		100,418		
7	Fish Springs, Utah	Fish Springs Range		5,250	(10)	13,650	(26)	29,925	(57)	31
		Dugway Mountains		3,508	(17)	7,223	(35)	9,906	(48)	35
		Swasey Mountain		0		6,435	(13)	9,900	(20)	53
		Total	113	8,758		27,308		49,731		
8	Dugway, Utah	Dugway Mountains	150	2,683	(13)	8,668	(42)	10,732	(52)	35
9	Government Creek, Utah	None	15	0		0		0		0
46	Sevier Desert, Utah	Rockwell		0		0		0		0
		Swasey Mountain	2	2,475	(5)	7,920	(16)	11,385	(23)	53
46A	Sevier Desert-Dry Lake, Utah	Swasey Mountain		3,465	(7)	7,425	(15)	7,920	(16)	53
		Howell Peak		0		0		6,433	(27)	0
		Notch Peak		511	(1)	9,203	(18)	30,167	(59)	24
		Total	67	3,976		16,628		44,520		
50	Milford, Utah[2]	None	0	0		0		0		0
52	Lund District, Utah[2]	None	0	0		0		0		0
53	Beryl-Enterprise, Utah[2]	Pine Valley Mountain	0	0		0		0		0
54	Wah Wah, Utah	Wah Wah Mountains		6,300	(18)	11,200	(32)	16,800	(48)	42
		Central Wah Wah Range		0		0		0		31
		King Top		2,543	(3)	5,086	(6)	5,934	(7)	34
		Total	176	8,843		16,286		22,734		

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Table 4.3-1. Construction-related data base for determination of impacts on wilderness quality (Page 2 of 4).

Hydrologic Subunit No.	Hydrologic Subunit Name	Wilderness Resource Name	Percent Subunit Road Intersection Increase As a Result of M-X Construction	Approximate WRA Within 1 Mi of Project Element Acres (Percent)		Approximate WRA Within 3 Mi of Project Element Acres (Percent)		Approximate WRA Within 6 Mi of Project Element Acres (Percent)		Increase in Number of Access Points Within 3 Mi Due to M-X Construction
137A	Big Smoky-Tonopah Flat, Nev.	Arc Dome	61	0		0		0		0
139	Kobeh, Nev.	Roberts		0		0		1,509	(10)	0
		Simpson Park		3,974	(8)	21,855	(44)	27,815	(56)	30
		Total	141	3,974		21,855		29,324		
140A	Monitor-North, Nev.	None	188	0		0		0		N/A
140B	Monitor-South, Nev.	None	8	0		0		0		N/A
141	Ralston, Nev.	None	143	0		0		0		N/A
142	Alkali Spring, Nev.	None	146	0		0		0		N/A
148	Cactus Flat, Nev.	Kawich	0	0		1,642	(6)	6,840	(25)	41
149	Stone Cabin, Nev.	Kawich		821	(3)	3,283	(12)	10,123	(37)	41
		Rawhide Mountain		644	(1)	10,941	(17)	27,031	(42)	38
		Total	137	1,465		14,224		37,154		
151	Antelope, Nev.	None	340	0		0		0		N/A
154	Newark, Nev.	None	114	0		0		0		N/A
155A	Little Smoky-North, Nev.	Antelope		2,622	(3)	9,614	(11)	12,236	(14)	7
		Park Range		7,905	(17)	13,950	(30)	15,810	(34)	23
		Total	114	10,527		23,564		28,046		
155C	Little Smoky-South, Nev.	Palisade Mesa		0		6,969	(7)	11,946	(12)	46
		The Wall	240	1,140	(3)	3,800	(10)	4,560	(12)	19
		Total	240	1,140		10,769		16,506		
156	Hot Creek, Nev.	Palisade Mesa		3,982	(4)	19,910	(20)	40,816	(41)	46
		South Reveille		5,310	(5)	11,682	(11)	16,992	(16)	66
		Kawich		4,378	(16)	9,850	(36)	10,397	(38)	41
		Rawhide Mountain		2,574	(4)	12,228	(19)	40,816	(41)	38
		Fandango		0		0		0		5
		Morey		604	(3)	9,658	(48)	20,120	(100)	19
		Antelope		0		874	(1)	11,362	(13)	7
		Park Range		0		0		6,975	(15)	23
		Total	238	17,988		64,202		147,478		
170	Penoyer, Nev.	Quinn		0		1,772	(2)	14,179	(16)	21
		Worthington Mountains	94	26,847	(57)	30,615	(65)	30,615	(65)	121
		Total	94			32,387		44,794		
171	Coal, Nev.	Weepah Spring	83	3,660	(6)	6,710	(11)	17,690	(29)	14
172	Garden, Nev.	Quinn		0		2,658	(3)	22,154	(25)	21
		Grant Range (USFS)		989	(1)	13,847	(14)	45,496	(46)	10
		Worthington Mountains	186	16,485	(35)	16,485	(35)	16,485	(35)	121
		Total	186	17,474		32,990		84,135		
173A	Railroad-South, Nev.	South Reveille	164	15,930	(15)	52,038	(49)	87,084	(82)	66

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Table 4.3-1. Construction-related data base for determination of impacts on wilderness quality (Page 3 of 4).

No.	Hydrologic Subunit Name	Wilderness Resource Name	Percent Subunit Road Intersection Increase As a Result of M-X Construction	Approximate WRA Within 1 Mi of Project Element Acres (Percent)		Approximate WRA Within 3 Mi of Project Element Acres (Percent)		Approximate WRA Within 6 Mi of Project Element Acres (Percent)		Increase in Number of Access Points Within 3 Mi Due to M-X Construction
173B	Railroad-North, Nev.	Palisade Mesa		10,951	(11)	26,879	(27)	46,789	(47)	46
		The Wall		2,280	(6)	13,300	(35)	33,820	(89)	19
		Quinn		4,431	(5)	25,699	(29)	52,283	(59)	21
		Grant Range(BLM)		0		4,847	(83)	5,840	(100)	3
		Grant Range(USFS)		0		3,956	(4)	24,726	(25)	10
		Blue Eagle		0		0		10,721	(18)	0
		Riordan's Well		0		1,704	(3)	17,040	(30)	21
		Total	108	17,662		76,385		191,219		
174	Jakes, Nev.	None	200	0		0		0		N/A
175	Long, Nev.	None	64	0		0		0		N/A
178B	Butte-South, Nev.	Goshute Canyon	94	0		0		1,982	(2)	0
179	Steptoe, Nev.[2]	Goshute Canyon		0		991	(1)	1,982	(2)	0
		Martin Spring		744	(3)	3,224	(13)	4,960	(20)	0
		Mount Grafton		0		545	(1)	7,085	(13)	20
		South Egan Range	0	0		0		851	(1)	0
		Total	0	744		4,760		14,878		
180	Cave, Nev.	South Egan Range		0		0		2,553	(3)	0
		Mount Grafton		545	(1)	4,360	(8)	21,255	(39)	20
		Far South Egan		11,454	(23)	22,908	(46)	24,402	(49)	37
		Total	123	11,999		27,268		48,210		
181	Dry Lake, Nev.	None	100	0		0	0		0	N/A
182	Delamar, Nev.	Delamar Mountains		3,801	(3)	10,136	(8)	16,471	(13)	3
		South Pahrocs/Hiko		286	(1)	1,716	(6)	6,006	(21)	4
		Total	82	4,087		11,852		22,477		
183	Lake, Nev.	Table Mountain		0		2,136	(6)	11,036	(31)	3
		Fortification Range		12,672	(32)	26,532	(67)	26,532	(67)	4
		Mount Grafton		9,810	(18)	20,165	(37)	21,255	(39)	20
		Parsnip Peak		0		0		770	(1)	5
		Total	111	22,482		46,697		59,593		
184	Spring, Nev.	Table Mountain		0		0		3,204	(9)	3
		Highland Ridge		0		760	(1)	8,362	(11)	15
		Wheeler Peak		0		0		0		4
		Mount Moriah		0		0		0		19
		Fortification Range		7,524	(19)	13,068	(33)	13,068	(33)	42
		Total	31	7,524		13,828		24,634		
196	Hamlin, Nev./Utah	Mountain Home Range		0		0		0		23
		Table Mountain		0		0		0		3
		White Rock Range		0		0		0		2
		Highland Ridge		0		0		0		15
		Total	68	0		0		0		
202	Patterson, Nev.	Parsnip Peak	5	2,310	(3)	7,700	(10)	23,870	(31)	5
205	Meadow Valley Wash, Nev.[2]	Meadow Valley Mountains		0		9,287	(5)	9,287	(5)	0
		Mormon Mountains		0		0		0		0
		Grapevine Spring		0		0		0		0
		Total	0	0		9,287		9,287		

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Table 4.3-1. Construction-related data base for determination of impacts on wilderness quality (Page 4 of 4).

Hydrologic Subunit No.	Hydrologic Subunit Name	Wilderness Resource Name	Percent Subunit Road Intersection Increase As a Result of M-X Construction	Approximate WRA Within 1 Mi of Project Element Acres (Percent)		Approximate WRA Within 3 Mi of Project Element Acres (Percent)		Approximate WRA Within 6 Mi of Project Element Acres (Percent)		Increase in Number of Access Points Within 3 Mi Due to M-X Construction
207	White River, Nev.	Grant Range (USFS)		0		1,978	(2)	7,912	(8)	10
		Riordan's Well		7,952	(14)	18,176	(32)	28,968	(51)	21
		Far South Egan		0		7,470	(15)	25,398	(51)	37
		South Egan Range		0		0		8,510	(10)	0
		Martin Spring		496	(2)	4,216	(17)	17,360	(70)	0
		Total	28	8,448		31,840		88,148		
208	Pahroc, Nev.	Weepah Spring	0	0		4,270	(7)	17,690	(29)	14
209	Pahranagat, Nev.	Desert National Wildlife Range		0		0		0		0
		East Pahranagat		0		0		0		0
		Medsger Pass		0		0		0		0
		Lower Pahranagat Lake		0		0		0		0
		South Pahrocs/Hiko		0		6,292	(22)	21,450	(75)	4
		Delamar Mountains		0		0		0		3
		Total	0	0		6,292		21,450		
210	Coyote Spring, Nev.[2]	Desert National Wildlife Range		14,603	(1)	58,414	(4)	131,431	(9)	0
		Fish and Wildlife #3		0		0		0		0
		Fish and Wildlife #2		3,964	(24)	7,102	(43)	12,552	(76)	0
		Arrow Canyon Range		5,320	(19)	7,280	(26)	8,960	(32)	0
		Meadow Valley Mountains		9,287	(5)	20,432	(11)	26,004	(14)	0
		Fish and Wildlife #1		0		8,991	(100)	8,991	(100)	0
		Evergreen		2,834	(100)	2,834	(100)	2,834	(100)	0
		Delamar Mountains		19,005	(15)	29,141	(23)	51,947	(41)	3
		Total	0	55,013		134,194		242,719		
219	Muddy River Springs, Nev.[2]	Arrow Canyon Range	0	4,760	(17)	10,640	(38)	14,000	(50)	0

T5087/9-18-81

[1]Wilderness Resource Area

[2]Hydrologic subunit associated with OB.

TABLE 4 3 2 PEAK YEAR PROJECTED POPULATION-RELATED INCREASED WILDERNESS RESOURCE USE FOR THE PROPOSED ACTION

PROPOSED ACTION FULL DEPLOYMENT NEVADA/UTAH
BASE 1 COYOTE SPRING, NEV
BASE 2 MILFORD, UTAH

NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-MOREY	1882 5	31 7	100 0	W-TAYLOR CREEK CYN	206 4	19 80	100 0
W FANDANGO	1882 5	31 7	100 0	W-BEAR TRAP CANYON	206 4	17 32	87 5
W-LA VERKIN CREEK	206 4	29 8	94 0	W-GOOSE CREEK CYN	167 4	6 46	32 6
W-ZION	9082 6	29 8	94 0	W-ORDERVILLE CYN	1909 1	3 75	18 9
W-TAYLOR CREEK CYN	206 4	29 8	94 0	W-N FORK VIRGIN R	870 9	2 88	14 5
W-RED BUTTE	206 4	29 8	94 0	W-TUNNEL SPRING	1298 0	1 36	6 9
W-BEAR TRAP CANYON	206 4	29 8	94 0	W-BONELLI PEAK	692 2	1 31	6 6
W PINE VALLEY MTN	2846 8	29 3	92 4	W-GARROTT BUTTES	735 5	1 24	6 3
W-ORDERVILLE CYN	1909 1	29 1	91 8	W-LA VERKIN CREEK	206 4	1 22	6 2
W-SIMPSON PARK	1118 7	29 1	91 8	W-THE WATCHMAN	192 7	1 15	5 8
W DEEP CREEK	334 9	29 1	91 8	W-EL DORADO	1113 1	1 06	5 4
W GOOSE CREEK CYN	167 4	29 1	91 8	W-IRETEBA PEAKS	963 0	1 00	5 1
W N FORK VIRGIN R	870 9	29 1	91 8	W-E OF BRYCE	231 4	0 96	4 8
W PARIA-HACKBERRY	474 1	28 7	90 5	W-RED BUTTE	206 4	0 86	4 3
W ASHDOWN GORGE	322 2	28 5	89 9	W-GRANT RANGE	933 8	0 76	3 8
W CEDAR BREAKS	322 2	28 5	89 9	W-CROSS CYN	348 2	0 74	3 7
W-RED MTN	245 3	28 4	89 6	W-SHEIKS FLAT	471 6	0 73	3 7
W STARVATION POINT	245 3	28 4	89 6	W-PINE CREEK	1380 7	0 66	3 3
W-PARIA CYN	1469 5	28 3	89 3	W-ESCALANTE 5	131 7	0 63	3 2
W-COTTONWOOD CYN	266 6	28 3	89 3	W-GEM	121 7	0 54	2 7
W COUGAR CANYON	147 4	28 2	89 0	W-EVERGREEN	210 7	0 46	2 3
W BURNING HILLS	60 7	28 2	89 0	W-NELLIS	197 2	0 39	2 0
W HOWELL PEAK	1356 8	27 9	88 0	W-LOWER PAHRANAGAT	210 7	0 39	2 0
W-THE WATCHMAN	192 7	27 9	88 0	W-ROBERTS	1249 8	0 35	1 8
W-THE BLUES	119 0	27 9	88 0	W-DEEP CREEK	334 9	0 35	1 8
W-PARUNUWEAP CYN	2388 6	27 8	87 7	W-S PAHROCS/HIKO	1731 4	0 34	1 7
W CANAAN MTN	385 3	27 8	87 7	W-FREMONT GORGE	337 7	0 30	1 5
W-CARCASS CANYON	88 1	27 7	87 4	W-MOREY	1882 5	0 30	1 5
W-HORSE SPRING CYN	88 1	27 7	87 4	W-WHITE ROCK RANGE	941 0	0 29	1 5
W RED CANYON N	254 4	27 6	87 1	W-BULLET CANYON	507 4	0 27	1 4
W-SCORPION	65 8	27 4	86 4	W-FISHLAKE MTN	276 4	0 26	1 3
W SPRING CANYON	214 3	27 4	86 4	W-CONGER RANGE	766 4	0 26	1 3
W-ESCALANTE 5	131 7	27 4	86 4	W-ZION	9082 6	0 25	1 3
W-N ESCALANTE	6638 7	27 4	86 4	W-KAWICH	1349 6	0 24	1 2
W-E OF BRYCE	231 4	27 2	85 8	W-PARIA CYN	1469 5	0 24	1 2
W-RED CANYON S	231 4	27 2	85 8	W-SQUAW PAPOOSE CYN	490 0	0 23	1 2
W-WAHWEEP	99 4	27 2	85 8	W-CEDAR BREAKS	322 2	0 23	1 2
W-BRYCE CANYON	257 2	27 2	85 8	W-GRAND GULCH	1701 3	0 23	1 2
W FIFTYMILE MTN	90 4	27 1	85 5	W-WHITE ROCK RANGE	74 6	0 23	1 2
W BOX DEATH HOLLOW	81 6	26 9	84 9	W-HONTONE MINE	63 7	0 22	1 1
W PIPPS DEATH	1192 3	26 9	84 9	W-MARTIN SPRING	1063 7	0 22	1 1
W MOQUITH MTN	174 0	26 7	84 2	W-HOWELL PEAK	572 9	0 21	1 1
W RAWHIDE MTN	1372 9	26 6	83 9	W-N ESCALANTE	6638 7	0 20	1 0
W THE WALL	1441 7	26 3	83 0	W-HOWELL PEAK	1356 8	0 20	1 0

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TABLE 4.3.2 PEAK YEAR PROJECTED POPULATION RELATED INCREASED WILDERNESS RESOURCE USE FOR THE PROPOSED ACTION

NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY*
W-PALISADE MESA	1441 7	24 3	83 0	W-UPPER MUDDY	94 1	0 20	1 0
W-BLUE EAGLE	1356 9	24 3	83 0	W-PIGEON SPRING	143 2	0 19	1 0
W-QUINN NORTH	1238 0	24 9	78 5	W-RESTING SPRINGS	64 8	0 18	0 9
W-S ROSEVILLE	1427 0	23 3	73 5	W-JUMBO SPRINGS	54 1	0 18	0 9
W-ROBERT	1249 8	23 3	73 5	W-DEATH VALLEY	1043 4	0 18	0 9
W-MT PENNEL	493 6	22 8	71 9	W-PARUNUWEAP CYN	2388 6	0 18	0 9
W-MT HILLERS	526 0	22 8	71 9	W-WHITE MTNS(FP)	1205 4	0 18	0 9
W-LITTLE ROCKIES	41 8	22 8	71 9	W-SPRING CANYON	214 3	0 18	0 9
W-MANCOS MESA	100 3	22 6	71 3	W-RED CANYON N	254 4	0 17	0 9
W-CHEESE BOX CANYON	58 7	22 3	70 3	W-QUAIL SPRING	192 2	0 17	0 9
W-SILVER PK RANGE	1060 4	22 2	70 0	W-PORTER MINE	120 4	0 17	0 9
W-CROSS CYN	348 2	22 2	70 0	W-PINE CANYON	507 4	0 16	0 8
W-GRANT RANGE(USES)	843 0	22 2	70 0	W-ASHDOWN GORGE	322 2	0 16	0 8
W-GABBS VALLEY	1004 5	22 2	70 0	W-MCCULLOUGH MTS	747 9	0 16	0 8
W-RUAD CYN	35 1	22 1	69 7	W-RED CANYON S	231 4	0 15	0 8
W-FISH CREEK CYN	35 1	22 1	69 7	W-SWASEY MTN	724 3	0 15	0 8
W-MULE CANYON	43 0	21 7	68 5	W-MT STIRLING	926 4	0 15	0 8
W-SQUAW PARIDISE CYN	490 0	21 6	68 1	W-FANDANGO	1882 5	0 15	0 8
W-ARCH CANYON	189 1	21 6	68 1	W-WEEPAH SPRING	1585 7	0 14	0 7
W-DARK CANYON	312 1	21 3	67 2	W-SILVER PK RANGE	1060 4	0 14	0 7
W-DARK WOODENHOE	142 4	21 3	67 2	W-THE WALL	1441 7	0 14	0 7
W-SWEET ALICE CYN	27 3	21 3	67 2	W-FORTIFICATION	874 1	0 13	0 7
W-MIDDLE POINT	54 8	21 3	67 2	W-PINE VALLEY MTN	2846 8	0 12	0 6
W-GRAND GULCH	1701 3	21 2	66 9	W-NOTHING FLATS	121 7	0 12	0 6
W-PINE CANYON	507 4	21 2	66 9	W-CRACK CANYON	228 0	0 12	0 6
W-DOUBT CANYON	507 4	21 2	66 9	W-MT GRAFTON	1076 3	0 12	0 6
W-SHEIKS FLAT	471 6	21 2	66 9	W-ARCH CANYON	189 1	0 12	0 6
W-GRANT RANGE	933 8	21 2	66 9	W-MT HILLERS	536 0	0 12	0 6
W-RIORDANS WELL	204 3	21 2	66 9	W-DEEP CREEK MTNS	737 8	0 11	0 6
W-BUCKHORN CANYON	507 4	21 2	66 9	W-DESATOYA MTNS	640 3	0 11	0 6
W-WHITE MTNS(FP)	1205 4	20 8	65 6	W-MEDSGER PASS	210 7	0 11	0 6
W-RAWICH	1349 6	20 8	65 6	W-FISH SPRINGS	596 5	0 10	0 5
W-PIGEON SPRING	143 2	20 7	65 3	W-RED SPRING	116 3	0 10	0 5
W-HIGHLAND RIDGE N	570 8	20 5	64 7	W-STARVATION POINT	245 3	0 10	0 5
W-WHEELER PEAK	570 8	20 5	64 7	W-SAN RAFAEL REEF	167 9	0 10	0 5
W-MARTIN SPRING	1063 7	19 9	62 8	W-HANKS CREEK	265 1	0 10	0 5
W-LITTLE HUMBOLDT R	7 4	19 8	62 5	W-PIPPS DEATH	1192 3	0 10	0 5
W-ANTELOPE	764 6	19 7	62 1	W-ROCK CREEK	274 8	0 10	0 5
W-PARK RANGE	213 7	19 4	61 2	W-BLUE EAGLE	1356 9	0 09	0 5
W-WORTHINGTON MTNS	163 8	19 3	60 9	W-AMARGOSA	121 7	0 09	0 5
W-WEEPAH SPRING	1585 7	19 0	59 9	W-SIDS MTN	235 1	0 09	0 5
W-QUEER MTN	1069 0	18 7	59 0	W-COTTONWOOD CYN	266 6	0 08	0 4
W-MT MORIAH	516 7	18 7	59 0	W-MORMON MTNS	1588 0	0 08	0 4
W-GRANITE SPRINGS	172 2	18 7	59 0	W-F & W 1	106 4	0 08	0 4

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TABLE 4 3-2 PEAK YEAR PROJECTED POPULATION-RELATED INCREASED WILDERNESS RESOURCE USE FOR THE PROPOSED ACTION.

NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-BASALT	114.7	18.7	59.0	W-FIDDLER BUTTE	20.2	0.08	0.4
W-EXCELSIOR	790.4	18.7	59.0	W-DELAMAR MTNS.	1591.4	0.08	0.4
W-HONTONE MINE	63.7	18.7	59.0	W-SIMPSON PARK	1118.7	0.08	0.4
W-S PAHROCS/HIKO	1731.4	18.0	56.8	W-E. PAHRANAGAT	210.7	0.08	0.4
W-BONNIE CLAIRE	161.3	17.9	56.5	W-MUD SPRING	545.9	0.08	0.4
W-FAR S EGAN	65.2	17.8	56.2	W-RAWHIDE MTN	1372.9	0.08	0.4
W-TUNNEL SPRING	1298.0	17.7	55.8	W-MEADOW VALLEY MTN	1809.9	0.07	0.4
W-ARC DOME	496.0	17.6	55.5	W-COTTONWOOD-SALMON	299.0	0.07	0.4
W-TABLE MOUNTAIN	147.5	17.4	54.9	W-FACTORY BUTTE	271.1	0.07	0.4
W-RED SPRING	116.3	17.3	54.6	W-QUEER MTN	1069.0	0.07	0.4
W-CEDAR RIDGE	116.3	17.3	54.6	W-KING TOP	663.3	0.07	0.4
W-FORTIFICATION	874.1	17.3	54.6	W-S REVEILLE	1427.0	0.06	0.3
W-PARSNIP PEAK	180.4	16.8	53.0	W-QUINN, NORTH	1298.0	0.06	0.3
W-WHITE ROCK RANGE	941.0	16.8	53.0	W-GOSHUTE CANYON	644.3	0.06	0.3
W-GRAPEVINE SPRING	682.2	16.8	53.0	W-GABBS VALLEY	1004.5	0.06	0.3
W-EVERGREEN	210.7	16.0	50.5	W-BLUE HILLS	32.7	0.06	0.3
W-E. PAHRANAGAT	210.7	16.0	50.5	W-MILLION HILLS	78.4	0.06	0.3
W-LOWER PAHRANAGAT	210.7	16.0	50.5	W-DEVILS CYN	235.1	0.06	0.3
W-MEDSGER PASS	210.7	16.0	50.5	W-AUGUSTA MTNS	646.4	0.06	0.3
W-MT GRAFTON	1076.3	16.0	50.5	W-JOB PEAK	526.6	0.05	0.3
W-S EGAN RANGE	169.3	16.0	50.5	W-MULLEN REEF	52.6	0.05	0.3
W-MEADOW VALLEY MTN	1809.9	15.0	47.3	W-INDIAN CREEK	13.8	0.05	0.3
W-DELAMAR MTNS	1591.4	15.0	47.3	W-GRAPEVINE SPRING	682.2	0.05	0.3

*INDEX OF PRIMACY (PERCENTAGE OF LARGEST VALUE) CALCULATED WITH PERCENT INCREASE CT 0153
+INDEX OF PRIMACY CALCULATED WITH INDEX OF V-D/ACRE

TABLE 4 3-3 PEAK YEAR POPULATION-RELATED INCREASED WILDERNESS RESOURCE USE FOR ALTERNATIVE 1

ALTERNATIVE 1 FULL DEPLOYMENT NEVADA/UTAH
BASE 1 COYOTE SPRING, NEV
BASE 2 BERYL, UTAH

NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-MOREY	1836 7	31 1	100 0	W-TAYLOR CREEK CYN	212 2	19 97	100 0
W-FANDANGO	1836 7	31 1	100 0	W-BEAR TRAP CANYON	212 2	17 47	87 5
W-COUGAR CANYON	169 4	31 1	100 0	W-GOOSE CREEK CYN	170 9	6 50	32 5
W-SPRING CANYON	251 0	30 6	98 4	W-ORDERVILLE CYN	1949 0	3 77	18 9
W-BEAR TRAP CANYON	212 2	30 4	97 7	W-N FORK VIRGIN R	889 0	2 89	14 5
W-LA VERKIN CREEK	212 2	30 4	97 7	W-TUNNEL SPRING	1349 6	1 37	6 9
W-RED BUTTE	212 2	30 4	97 7	W-BONELLI PEAK	711 1	1 31	6 6
W-TAYLOR CREEK CYN	212 2	30 4	97 7	W-GARROTT BUTTES	755 5	1 25	6 3
W-ZION	9337 1	30 4	97 7	W-LA VERKIN CREEK	212 2	1 23	6 2
W-PINE VALLEY MTN	2987 2	30 3	97 4	W-THE WATCHMAN	195 8	1 16	5 8
W-CEDAR BREAKS	349 6	30 2	97 1	W-EL DORADO	1138 6	1 06	5 3
W-ASHDOWN GORGE	349 6	30 2	97 1	W-IRETEBA PEAKS	984 6	1 00	5 0
W-ORDERVILLE CYN	1949 0	29 5	94 9	W-E OF BRYCE	229 4	0 96	4 8
W-GOOSE CREEK CYN	170 9	29 5	94 9	W-RED BUTTE	212 2	0 87	4 4
W-DEEP CREEK	341 9	29 5	94 9	W-GRANT RANGE	915 9	0 75	3 8
W-N FORK VIRGIN R	889 0	29 5	94 9	W-CROSS CYN	350 6	0 75	3 8
W-RED MTN	253 1	29 0	93 2	W-SHEIKS FLAT	471 1	0 73	3 7
W-STARVATION POINT	253 1	29 0	93 2	W-PINE CREEK	1412 9	0 66	3 3
W-COTTONWOOD CYN	274 8	28 9	92 9	W-ESCALANTE 5	130 5	0 63	3 2
W-SIMPSON PARK	1094 3	28 6	92 0	W-GEM	124 7	0 54	2 7
W-PARIA-HACKBERRY	469 8	28 5	91 6	W-EVERGREEN	214 4	0 47	2 4
W-PARIA CYN	1476 4	28 4	91 3	W-CAPITOL REEF	465 3	0 44	2 2
W-THE WATCHMAN	195 8	28 2	90 7	W-NELLIS	201 9	0 39	2 0
W-PARUNUWEAP CYN	2428 0	28 2	90 7	W-LOWER PAHRANAGAT	214 4	0 39	2 0
W-RED CANYON N	261 7	28 2	90 7	W-ROBERTS	1216 3	0 35	1 8
W-CANAAN MTN	391 7	28 2	90 7	W-DEEP CREEK	341 9	0 35	1 8
W-BURNING HILLS	60 4	28 1	90 4	W-S PAHROCS/HIKO	1769 9	0 34	1 7
W-HOWELL PEAK	1365 0	28 0	90 0	W-MOREY	1836 7	0 29	1 5
W-THE BLUES	119 7	28 0	90 0	W-WHITE ROCK RANGE	1003 2	0 29	1 5
W-PIPES DEATH	1239 2	27 7	89 1	W-BULLET CANYON	506 9	0 27	1 4
W-BOX DEATH HOLLOW	84 8	27 7	89 1	W-CONGER RANGE	692 3	0 26	1 3
W-HORSE SPRING CYN	87 2	27 5	88 4	W-ZION	9337 1	0 25	1 3
W-CARCASS CANYON	87 2	27 5	88 4	W-KAWICH	1369 2	0 24	1 2
W-WAHWEEP	100 9	27 5	88 4	W-CEDAR BREAKS	349 6	0 24	1 2
W-FIFTYMILE MTN	91 8	27 4	88 1	W-PARIA CYN	1476 4	0 24	1 2
W-SCORPION	65 2	27 2	87 5	W-WHITE ROCK RANGE	84 1	0 24	1 2
W-N ESCALANTE	6575 2	27 2	87 5	W-SQUAW PAPOOSE CYN	488 5	0 23	1 2
W-ESCALANTE 5	130 5	27 2	87 5	W-GRAND GULCH	1699 6	0 23	1 2
W-RED CANYON S	229 4	27 0	86 8	W-FACTORY BUTTE	262 2	0 23	1 2
W-E OF BRYCE	229 4	27 0	86 8	W-HONTONE MINE	64 2	0 22	1 1
W-BRYCE CANYON	255 0	27 0	86 8	W-HOWELL PEAK	533 6	0 21	1 1
W-MOQUITH MTN	176 1	26 9	86 5	W-HORSESHOE CYN	30 6	0 21	1 1
W-RAWHIDE MTN	1337 2	26 1	83 9	W-MARTIN SPRING	974 0	0 21	1 1
W-BLUE EAGLE	1321 2	25 8	83 0	W-UPPER MUDDY	100 6	0 21	1 1

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TABLE 4 3-3 PEAK YEAR POPULATION-RELATED INCREASED WILDERNESS RESOURCE USE FOR ALTERNATIVE 1

NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-PALISADE MESA	1403 8	25 8	83 0	W-N ESCALANTE	6575 2	0 20	1 0
W-THE WALL	1403 8	25 8	83 0	W-HOWELL PEAK	1365 0	0 20	1 0
W-QUINN, NORTH	1294 7	24 9	80 1	W-SPRING CANYON	251 0	0 19	1 0
W-S REVEILLE	1461 4	23 7	76 2	W-PIGEON SPRING	143 1	0 19	1 0
W-ROBERTS	1216 3	22 9	73 6	W-JUMBO SPRINGS	55 6	0 18	0 9
W-MT PENNEL	492 0	22 8	73 3	W-WHITE MTNS(FP)	1210 1	0 18	0 9
W-LITTLE ROCKIES	41 7	22 8	73 3	W-RESTING SPRINGS	66 8	0 18	0 9
W-MT HILLERS	534 2	22 8	73 3	W-PARUNUWEAP CYN	2428 0	0 18	0 9
W-MANCOS MESA	99 2	22 4	72 0	W-DEATH VALLEY	1051 8	0 18	0 9
W-CROSS CYN	350 6	22 3	71 7	W-QUAIL SPRING	199 3	0 17	0 9
W-SILVER PK RANGE	1064 7	22 3	71 7	W-PORTER MINE	121 4	0 17	0 9
W-ROAD CYN	35 3	22 2	71 4	W-RED CANYON N	261 7	0 17	0 9
W-FISH CREEK CYN	35 3	22 2	71 4	W-ASHDOWN GORGE	349 6	0 17	0 9
W-GABBS VALLEY	1000 9	22 2	71 4	W-PINE CANYON	506 9	0 16	0 8
W-CHEESE BOX CANYON	58 1	22 1	71 1	W-MCCULLOUGH MTS	764 2	0 16	0 8
W-GRANT RANGE(USFS)	828 2	21 9	70 4	W-SWASEY MTN	696 2	0 15	0 8
W-MIDDLE POINT	55 5	21 6	69 5	W-MT STIRLING	959 2	0 15	0 8
W-DARK-WOODENSHOE	144 3	21 6	69 5	W-RED CANYON S	229 4	0 15	0 8
W-ARCH CANYON	188 6	21 6	69 5	W-FANDANGO	1836 7	0 14	0 7
W-SQUAW PAPOOSE CYN	488 5	21 6	69 5	W-WEEPAH SPRING	1630 7	0 14	0 7
W-MULE CANYON	42 9	21 6	69 5	W-THE WALL	1403 8	0 14	0 7
W-DARK CANYON	316 2	21 6	69 5	W-SILVER PK RANGE	1064 7	0 14	0 7
W-SWEET ALICE CYN	27 7	21 5	69 1	W-CRACK CANYON	212 7	0 13	0 7
W-BULLET CANYON	506 9	21 1	67 8	W-FORTIFICATION	876 2	0 13	0 7
W-GRAND GULCH	1699 6	21 1	67 8	W-NOTHING FLATS	124 7	0 12	0 6
W-PINE CANYON	506 9	21 1	67 8	W-MEDSGER PASS	214 4	0 12	0 6
W-SHEIKS FLAT	471 1	21 1	67 8	W-PINE VALLEY MTN	2987 2	0 12	0 6
W-SLICKHORN CANYON	506 9	21 1	67 8	W-MT GRAFTON	1076 4	0 12	0 6
W-KAWICH	1369 2	21 0	67 5	W-ARCH CANYON	188 6	0 12	0 6
W-GRANT RANGE	915 9	20 8	66 9	W-MT HILLERS	534 2	0 12	0 6
W-RIORDANS WELL	200 4	20 8	66 9	W-DEEP CREEK MTNS	724 4	0 11	0 6
W-WHITE MTNS(FP)	1210 1	20 8	66 9	W-DESATOYA MTNS	634 4	0 11	0 6
W-PIGEON SPRING	143 1	20 7	66 6	W-SAN RAFAEL REEF	179 3	0 11	0 6
W-WORTHINGTON MTNS	168 4	19 8	63 7	W-ROCK CREEK	272 7	0 10	0 5
W-ANTELOPE	755 5	19 5	62 7	W-FISH SPRINGS	650 4	0 10	0 5
W-WEEPAH SPRING	1630 7	19 4	62 4	W-RED SPRING	112 6	0 10	0 5
W-HIGHLAND RIDGE,N	531 9	19 4	62 4	W-HANKS CREEK	260 4	0 10	0 5
W-WHEELER PEAK	531 9	19 4	62 4	W-PIPPS DEATH	1239 2	0 10	0 5
W-LITTLE HUMBOLDT R	7 1	19 1	61 4	W-STARVATION POINT	253 1	0 10	0 5
W-MARTIN SPRING	974 0	19 0	61 1	W-AMARGOSA	124 7	0 09	0 5
W-PARK RANGE	206 4	18 9	60 8	W-BLUE EAGLE	1321 2	0 09	0 5
W-HONTONE MINE	64 2	18 8	60 5	W-SIDS MTN	251 5	0 09	0 5
W-QUEER MTN	1073 4	18 8	60 5	W-RAWHIDE MTN	1337 2	0 08	0 4

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NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-BASALT	115.6	18.8	60.5	W-MUD SPRING	524.7	0.08	0.4
W-EXCELSIOR	796.1	18.8	60.5	W-MORMON MTNS	1610.9	0.08	0.4
W-S PAHROCS/HIKO	1769.9	18.4	59.2	W-SIMPSON PARK	1094.3	0.08	0.4
W-TUNNEL SPRING	1349.6	18.3	58.8	W-F & W 1	108.1	0.08	0.4
W-FAR S EGAN	66.6	18.1	58.2	W-DELAMAR MTNS	1617.7	0.08	0.4
W-GRANITE SPRINGS	163.8	18.0	57.9	W-E PAHRANAGAT	214.4	0.08	0.4
W-BONNIE CLAIRE	162.0	18.0	57.9	W-FREMONT GORGE	326.5	0.08	0.4
W-MT MORIAH	491.5	18.0	57.9	W-COTTONWOOD CYN	274.8	0.08	0.4
W-TABLE MOUNTAIN	151.1	17.7	56.9	W-COTTONWOOD-SALMON	292.4	0.07	0.4
W-WHITE ROCK RANGE	1003.2	17.7	56.9	W-MEADOW VALLEY MTN	1837.6	0.07	0.4
W-PARSNIP PEAK	192.4	17.7	56.9	W-KING TOP	617.8	0.07	0.4
W-ARC DOME	495.2	17.6	56.6	W-QUEER MTN	1073.4	0.07	0.4
W-FORTIFICATION	876.2	17.3	55.6	W-GOSHUTE CANYON	601.0	0.06	0.3
W-GRAPEVINE SPRING	708.8	17.3	55.6	W-MILLION HILLS	81.9	0.06	0.3
W-RED SPRING	112.6	16.9	54.3	W-AUGUSTA MTNS	640.3	0.06	0.3
W-CEDAR RIDGE	112.6	16.9	54.3	W-QUINN, NORTH	1294.7	0.06	0.3
W-LOWER PAHRANAGAT	214.4	16.2	52.1	W-S REVEILLE	1461.4	0.06	0.3
W-E PAHRANAGAT	214.4	16.2	52.1	W-MULLEN REEF	56.3	0.06	0.3
W-MEDSGER PASS	214.4	16.2	52.1	W-GABBS VALLEY	1000.9	0.06	0.3
W-EVERGREEN	214.4	16.2	52.1	W-DEVILS CYN	251.5	0.06	0.3
W-S EGAN RANGE	169.3	16.0	51.4	W-JOB PEAK	523.3	0.05	0.3
W-MT GRAFTON	1076.4	16.0	51.4	W-INDIAN CREEK	14.6	0.05	0.3
W DELAMAR MTNS	1617.7	15.3	49.2	W-CEDAR RIDGE	112.6	0.05	0.3
W-MEADOW VALLEY MTN	1837.6	15.2	48.9	W-GRAPEVINE SPRING	708.8	0.05	0.3
W-F & W 1	108.1	15.2	48.9	W-BRYCE CANYON	255.0	0.05	0.3

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*INDEX OF PRIMACY (PERCENTAGE OF LARGEST VALUE) CALCULATED WITH PERCENT INCREASE
+INDEX OF PRIMACY CALCULATED WITH INDEX OF V-D/ACRE

TABLE 4 3-4 PEAK YEAR PROJECTED POPULATION RELATED INCREASED WILDERNESS RESOURCE USE FOR ALTERATIVE 2

ALTERNATIVE 2 FULL DEPLOYMENT NEVADA/UTAH
BASE 1 COYOTE SPRING, NEV.
BASE 2 DELTA, UTAH

NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-MOREY	1840.8	31.2	100.0	W-TAYLOR CREEK CYN	195.2	19.48	100.0
W-FANDANGO	1840.8	31.2	100.0	W-BEAR TRAP CANYON	195.2	17.04	87.5
W-SIMPSON PARK	1105.9	28.8	92.3	W-GOOSE CREEK CYN	157.2	6.35	32.6
W-PARIA CYN	1497.6	28.7	92.0	W-ORDERVILLE CYN	1792.5	3.68	18.9
W-BEAR TRAP CANYON	195.2	28.6	91.7	W-N FORK VIRGIN R	817.7	2.83	14.5
W-LA VERKIN CREEK	195.2	28.6	91.7	W-TUNNEL SPRING	1238.7	1.34	6.9
W-RED BUTTE	195.2	28.6	91.7	W-BONELLI PEAK	687.3	1.31	6.7
W-TAYLOR CREEK CYN	195.2	28.6	91.7	W-GARROTT BUTTES	730.2	1.24	6.4
W-ZION	8589.6	28.6	91.7	W-LA VERKIN CREEK	195.2	1.20	6.2
W-PINE VALLEY MTN	2685.3	28.1	90.1	W-THE WATCHMAN	185.8	1.14	5.9
W-DEEP CREEK	314.5	27.8	89.1	W-EL DORADO	1106.0	1.06	5.4
W-GOOSE CREEK CYN	157.2	27.8	89.1	W-IRETEBA PEAKS	956.8	0.99	5.1
W-N FORK VIRGIN R	817.7	27.8	89.1	W-E OF BRYCE	218.3	0.95	4.9
W-COTTONWOOD CYN	260.2	27.8	89.1	W-RED BUTTE	195.2	0.85	4.4
W-ORDERVILLE CYN	1792.5	27.8	89.1	W-GRANT RANGE	896.4	0.75	3.9
W-STARVATION POINT	238.0	27.8	89.1	W-CROSS CYN	349.7	0.74	3.8
W-RED MTN	238.0	27.8	89.1	W-SHEIKS FLAT	483.6	0.73	3.7
W-CEDAR BREAKS	288.1	27.5	88.1	W-PINE CREEK	1371.9	0.66	3.4
W-PARIA-HACKBERRY	447.0	27.5	88.1	W-ESCALANTE 5	124.9	0.62	3.2
W-ASHDOWN GORGE	288.1	27.5	88.1	W-GEM	120.6	0.54	2.8
W-COUGAR CANYON	131.3	27.2	87.2	W-DEVILS CYN	289.2	0.54	2.8
W-SPRING CANYON	199.7	27.2	87.2	W-EVERGREEN	207.4	0.46	2.4
W-THE WATCHMAN	185.8	27.1	86.9	W-LOWER PAHRANAGAT	207.4	0.39	2.0
W-PARUNUWEAP CYN	2303.2	27.1	86.9	W-NELLIS	196.0	0.39	2.0
W-CANAAN MTN	371.5	27.1	86.9	W-ROCKWELL	440.7	0.36	1.8
W-HOWELL PEAK	1288.0	26.9	86.2	W-ROBERTS	1233.2	0.35	1.8
W-THE BLUES	113.0	26.9	86.2	W-DEEP CREEK	314.5	0.34	1.7
W-BURNING HILLS	56.3	26.7	85.6	W-S PAHROCS/HIKO	1695.7	0.33	1.7
W-CARCASS CANYON	83.3	26.6	85.3	W-FREMONT GORGE	317.0	0.30	1.5
W-HORSE SPRING CYN	83.3	26.6	85.3	W-MOREY	1840.8	0.29	1.5
W-WAHWEEP	96.2	26.5	84.9	W-BULLET CANYON	520.3	0.28	1.4
W-FIFTYMILE MTN	87.5	26.5	84.9	W-WHITE ROCK RANGE	915.0	0.28	1.4
W-N ESCALANTE	6293.9	26.3	84.3	W-FISHLAKE MTN	257.4	0.26	1.3
W-SCORPION	62.4	26.3	84.3	W-CONGER RANGE	718.5	0.26	1.3
W-ESCALANTE 5	124.9	26.3	84.3	W-ZION	8589.6	0.25	1.3
W-RED CANYON N	223.5	26.2	84.0	W-KAWICH	1328.3	0.24	1.2
W-BOX DEATH HOLLOW	73.4	26.1	83.7	W-PARIA CYN	1497.6	0.24	1.2
W-MOQUITH MTN	168.4	26.1	83.7	W-GRAND GULCH	1744.5	0.23	1.2
W-RAWHIDE MTN	1330.9	26.0	83.3	W-SQUAW PAPOOSE CYN	494.1	0.23	1.2
W-E OF BRYCE	218.3	26.0	83.3	W-CEDAR BREAKS	288.1	0.22	1.1
W-PIPPS DEATH	1070.9	26.0	83.3	W-WHITE ROCK RANGE	68.9	0.22	1.1
W-BRYCE CANYON	242.6	26.0	83.3	W-HONTONE MINE	63.2	0.22	1.1
W-RED CANYON S	218.3	26.0	83.3	W-MARTIN SPRING	1025.3	0.21	1.1
W-BLUE EAGLE	1314.9	25.7	82.4	W-HOWELL PEAK	565.5	0.21	1.1

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TABLE 4 3-4 PEAK YEAR PROJECTED POPULATION RELATED INCREASED WILDERNESS RESOURCE USE FOR ALTERATIVE 2

NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-PALISADE MESA	1397.1	25.7	82.4	W-N ESCALANTE	6293.9	0.20	1.0
W-THE WALL	1397.1	25.7	82.4	W-HOWELL PEAK	1288.0	0.20	1.0
W-QUINN, NORTH	1267.4	24.5	78.5	W-PIGEON SPRING	142.9	0.19	1.0
W-ROBERTS	1233.2	23.1	74.0	W-JUMBO SPRINGS	53.7	0.18	0.9
W-S REVEILLE	1404.1	23.0	73.7	W-WHITE MTNS(FP)	1194.9	0.18	0.9
W-MANCOS MESA	100.4	22.6	72.4	W-PARUNUWEAP CYN	2303.2	0.18	0.9
W-LITTLE ROCKIES	41.0	22.5	72.1	W-RESTING SPRINGS	64.2	0.18	0.9
W-MT HILLERS	525.3	22.5	72.1	W-DEATH VALLEY	1029.2	0.18	0.9
W-MT PENNEL	483.8	22.5	72.1	W-SPRING CANYON	199.7	0.17	0.9
W-ROAD CYN	35.3	22.2	71.2	W-PORTER MINE	118.8	0.17	0.9
W-FISH CREEK CYN	35.3	22.2	71.2	W-QUAIL SPRING	190.8	0.17	0.9
W-CROSS CYN	349.7	22.2	71.2	W-NEPHI	502.5	0.16	0.8
W CHEESE BOX CANYON	58.1	22.1	70.8	W-MCCULLOUGH MTS	743.0	0.16	0.8
W-GABBS VALLEY	999.2	22.1	70.8	W-PINE CANYON	520.3	0.16	0.8
W SILVER PK RANGE	1050.9	22.0	70.5	W-RED CANYON S	218.3	0.15	0
W-ARCH CANYON	190.7	21.8	69.9	W-RED CANYON N	223.5	0.15	0.8
W MULE CANYON	43.4	21.8	69.9	W-ASHDOWN GORGE	288.1	0.15	0.8
W-SQUAW PAPOOSE CYN	494.1	21.8	69.9	W-MT STIRLING	918.0	0.15	0.8
W-DARK-WOODENSHOE	145.5	21.7	69.6	W-SWASEY MTN	790.7	0.15	0.8
W-DARK CANYON	319.0	21.7	69.6	W-THE WALL	1397.1	0.14	0.7
W-MIDDLE POINT	56.0	21.7	69.6	W-WEEPAH SPRING	1563.3	0.14	0.7
W-SWEET ALICE CYN	28.0	21.7	69.6	W-FANDANGO	1840.8	0.14	0.7
W-PINE CANYON	520.3	21.6	69.2	W-SILVER PK RANGE	1050.9	0.14	0.7
W-SHEIKS FLAT	483.6	21.6	69.2	W-FORTIFICATION	846.0	0.13	0.7
W-BULLET CANYON	520.3	21.6	69.2	W-NOTHING FLATS	120.6	0.12	0.6
W GRAND GULCH	1744.5	21.6	69.2	W-CRACK CANYON	178.8	0.12	0.6
W GRANT RANGE(USFS)	812.2	21.6	69.2	W-ARCH CANYON	190.7	0.12	0.6
W SLICKHORN CANYON	520.3	21.6	69.2	W-MT HILLERS	525.3	0.12	0.6
W PIGEON SPRING	142.9	20.7	66.3	W-MT GRAFTON	1038.3	0.12	0.6
W WHITE MTNS(FP)	1194.9	20.6	66.0	W-PINE VALLEY MTN	2685.3	0.11	0.6
W-KAWICH	1328.3	20.5	65.7	W-MEDSC R PASS	207.4	0.11	0.6
W RIORDANS WELL	196.1	20.5	65.7	W-DESATOYA MTNS	629.5	0.11	0.6
W-GRANT RANGE	896.4	20.5	65.7	W-SAN RAFAEL REEF	206.0	0.11	0.6
W LITTLE HUMBOLDT R	7.3	19.6	62.8	W-DEEP CREEK MTNS	752.9	0.11	0.6
W ANTELOPE	749.9	19.4	62.2	W-PIPPS DEATH	1070.9	0.10	0.5
W MARTIN SPRING	1025.3	19.3	61.9	W-FISH SPRINGS	613.0	0.10	0.5
W WORTHINGTON MTNS	162.0	19.2	61.5	W-ROCK CREEK	280.8	0.10	0.5
W PARK RANGE	210.2	19.2	61.5	W-RED SPRING	114.6	0.10	0.5
W WHEELER PEAK	535.9	19.1	61.2	W-UPPER MUDDY	115.9	0.10	0.5
W HIGHLAND RIDGE, N	535.9	19.1	61.2	W-HANKS CREEK	270.6	0.10	0.5
W WEEPAH SPRING	1563.3	18.8	60.3	W-STARVATION POINT	238.0	0.10	0.5
W HONTONE MINE	63.2	18.6	59.6	W-AMARGOSA	120.6	0.09	0.5
W-EXCELSIOR	784.1	18.6	59.6	W-BLUE EAGLE	1314.9	0.09	0.5

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NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W BASALT	113 8	18 6	59 6	W-SIMPSON PARK	1105 9	0 08	0 4
W-QUEER MTN	1060 7	18 6	59 6	W-COTTONWOOD CYN	260 2	0 08	0 4
W-MT MORIAH	503 5	17 9	57 4	W-F & W 1	104 1	0 08	0 4
W-GRANITE SPRINGS	167 8	17 9	57 4	W-MUD SPRING	595 9	0 08	0 4
W BONNIE CLAIRE	159 7	17 8	57 1	W-RAWHIDE MTN	1330 9	0 08	0 4
W-S PAHROCS/HIKO	1695 7	17 7	56 7	W-E PAHRANAGAT	207 4	0 08	0 4
W-ARC DOME	492 2	17 5	56 1	W-MORMON MTNS	1556 3	0 08	0 4
W-FAR S EGAN	63 1	17 3	55 4	W-DELAMAR MTNS.	1569 0	0 08	0 4
W-TUNNEL SPRING	1238 7	17 1	54 8	W-FACTORY BUTTE	254 7	0 07	0 4
W-RED SPRING	114 6	17 1	54 8	W-KING TOP	654 8	0 07	0 4
W-CEDAR RIDGE	114 6	17 1	54 8	W-QUEER MTN	1060 7	0 07	0 4
W-TABLE MOUNTAIN	141 9	16 9	54 2	W-COTTONWOOD-SALMON	306 6	0 07	0 4
W-FORTIFICATION	846 0	16 8	53 8	W-S REVEILLE	1404 1	0 06	0 3
W PARSNIP PEAK	175 4	16 4	52 6	W-GABBS VALLEY	999 2	0 06	0 3
W WHITE ROCK RANGE	915 0	16 4	52 6	W-SIDS MTN	289 2	0 06	0 3
W-GRAPEVINE SPRING	651 4	16 2	51 9	W-MEADOW VALLEY MTN	1770 6	0 06	0 3
W-MEDSGER PASS	207 4	15 8	50 6	W-GOSHUTE CANYON	624 5	0 06	0 3
W EVERGREEN	207 4	15 8	50 6	W-MILLION HILLS	77 6	0 06	0 3
W-E PAHRANAGAT	207 4	15 8	50 6	W-QUINN, NORTH	1267 4	0 06	0 3
W-LOWER PAHRANAGAT	207 4	15 8	50 6	W-AUGUSTA MTNS	635 0	0 06	0 3
W S EGAN RANGE	163 3	15 5	49 7	W-JOB PEAK	520 1	0 05	0 3
W MT GRAFTON	1038 3	15 5	49 7	W-RED MTN	238 0	0 05	0 3

*INDEX OF PRIMACY (PERCENTAGE OF LARGEST VALUE) CALCULATED WITH PERCENT INCREASE CT0155
+INDEX OF PRIMACY CALCULATED WITH INDEX OF V-D/ACRE

TABLE 4 3-5 PEAK YEAR PROJECTED POPULATION RELATED INCREASED WILDERNESS RESOURCE USE FOR ALTERNATIVE 3

ALTERNATIVE 3 FULL DEPLOYMENT NEVADA/UTAH
BASE 1 BERYL, UTAH
BASE 2 ELY, NEV

NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-COUGAR CANYON	186 0	33 2	100 0	W-TAYLOR CREEK CYN	211 0	19 93	100 0
W-MOREY	1881 6	31 7	95 5	W-BEAR TRAP CANYON	211 0	17 44	87 5
W-FANDANGO	1881 6	31 7	95 5	W-GOOSE CREEK CYN	168 8	6 48	32 5
W-SIMPSON PARK	1230 2	31 7	95 5	W-PUEBLO MOUNTAIN	116 0	4 03	20 2
W-PINE VALLEY MTN	3184 2	31 7	95 5	W-ORDERVILLE CYN	1925 3	3 76	18 9
W-LA VERKIN CREEK	211 0	30 2	91 0	W-N FORK VIRGIN R	878 2	2 88	14 5
W-BEAR TRAP CANYON	211 0	30 2	91 0	W-TUNNEL SPRING	1136 6	1 33	6 7
W-RED BUTTE	211 0	30 2	91 0	W-BONELLI PEAK	294 7	1 25	6 3
W-TAYLOR CREEK CYN	211 0	30 2	91 0	W-LA VERKIN CREEK	211 0	1 23	6 2
W-ZION	9284 2	30 2	91 0	W-GARROTT BUTTES	313 2	1 19	6 0
W-SPRING CANYON	245 0	30 1	90 7	W-THE WATCHMAN	179 3	1 13	5 7
W-ASHDOWN GORGE	337 9	29 4	88 6	W-EL DORADO	459 6	1 00	5 0
W-CEDAR BREAKS	337 9	29 4	88 6	W-E OF BRYCE	239 0	0 97	4 9
W-BURNING HILLS	64 3	29 4	88 6	W-IRETEBA PEAKS	396 4	0 95	4 8
W-GOOSE CREEK CYN	168 8	29 3	88 3	W-RED BUTTE	211 0	0 87	4 4
W-N FORK VIRGIN R	878 2	29 3	88 3	W-GRANT RANGE	1042 3	0 77	3 9
W-ORDERVILLE CYN	1925 3	29 3	88 3	W-CROSS CYN	347 9	0 74	3 7
W-DEEP CREEK	337 8	29 3	88 3	W-SHEIKS FLAT	468 1	0 72	3 6
W-MARTIN SPRING	1723 0	29 3	88 3	W-ESCALANTE 5	132 1	0 63	3 2
W-HIGHLAND RIDGE,N	901 8	28 9	87 0	W-PINE CREEK	570 3	0 62	3 1
W-WHEELER PEAK	901 8	28 9	87 0	W-GEM	79 8	0 52	2 6
W-PARIA HACKBERRY	475 8	28 8	86 7	W-EVERGREEN	98 0	0 42	2 1
W-RAWHIDE MTN	1524 4	28 7	86 4	W-COTTONWOOD-SALMON	446 5	0 41	2 1
W-BLUE EAGLE	1511 7	28 5	85 8	W-ROBERTS	1518 6	0 37	1 9
W-PALISADE MESA	1606 2	28 5	85 8	W-NELLIS	82 4	0 37	1 9
W-THE WALL	1706 2	28 5	85 8	W-LOWER PAHRANAGAT	98 0	0 36	1 8
W-RED CANYON N	259 5	28 0	84 3	W-DEEP CREEK	337 8	0 35	1 8
W-THE BLUES	119 5	28 0	84 3	W-S PAHROCS/HIKO	964 6	0 31	1 6
W-HOWELL PEAK	1362 7	28 0	84 3	W-FREMONT GORGE	318 3	0 30	1 5
W-PARIA CYN	1440 7	27 9	84 0	W-WHITE ROCK RANGE	1032 4	0 30	1 5
W-E OF BRYCE	239 0	27 8	83 7	W-MOREY	1881 6	0 30	1 5
W-BRYCE CANYON	265 6	27 8	83 7	W-BULLET CANYON	503 6	0 27	1 4
W-RED CANYON S	239 0	27 8	83 7	W-CONGER RANGE	1133 9	0 27	1 4
W-HORSE SPRING CYN	88 7	27 8	83 7	W-FISHLAKE MTN	261 6	0 26	1 3
W-CARCASS CANYON	88 7	27 8	83 7	W-WHITE ROCK RANGE	107 2	0 25	1 3
W-STARVATION POINT	236 5	27 6	83 1	W-ZION	9284 2	0 25	1 3
W-RED MTN	236 5	27 6	83 1	W-CEDAR BREAKS	337 9	0 24	1 2
W-ROBERTS	1518 6	27 5	82 8	W-MARTIN SPRING	1723 0	0 24	1 2
W-SCORPION	66 0	27 4	82 5	W-PARIA CYN	1440 7	0 24	1 2
W-N ESCALANTE	6655 9	27 4	82 5	W-SQUAW PAPOOSE CYN	490 3	0 23	1 2
W-ESCALANTE 5	132 1	27 4	82 5	W-GRAND GULCH	1688 6	0 23	1 2
W-COTTONWOOD CYN	251 4	27 1	81 6	W-KAWICH	1058 2	0 23	1 2

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TABLE 4 3-5 PEAK YEAR PROJECTED POPULATION RELATED INCREASED WILDERNESS RESOURCE USE FOR ALTERNATIVE 3

NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-PIPPS DEATH	1179.5	26.7	80.4	W-HOWELL PEAK	812.9	0.22	1.1
W-BOX DEATH HOLLOW	80.7	26.7	80.4	W-HONTONE MINE	58.2	0.21	1.1
W-THE WATCHMAN	179.3	26.4	79.5	W-LITTLE GOOSE CR	100.8	0.20	1.0
W-CANAAN MTN	358.6	26.4	79.5	W-N ESCALANTE	6655.9	0.20	1.0
W-PARUNUWEAP CYN	2222.9	26.4	79.5	W-HOWELL PEAK	1362.7	0.20	1.0
W-WAHWEEP	95.4	26.4	79.5	W-PIGEON SPRING	121.9	0.19	1.0
W-FIFTYMILE MTN	86.7	26.3	79.2	W-SPRING CANYON	245.0	0.18	0.9
W-MT MORIAH	790.9	26.1	78.6	W-DEATH VALLEY	681.1	0.18	0.9
W-GRANITE SPRINGS	263.6	26.1	78.6	W-PARUNUWEAP CYN	2222.9	0.18	0.9
W-MOQUITH MTN	166.7	25.9	78.0	W-PORTER MINE	78.6	0.17	0.9
W-QUINN, NORTH	1293.8	24.8	74.7	W-RED CANYON N	259.5	0.17	0.9
W-LITTLE HUMBOLDT R	9.3	24.2	72.9	W-WHITE MTNS(FP)	1051.9	0.17	0.9
W-GRANT RANGE(USFS)	925.4	23.9	72.0	W-JUMBO SPRINGS	23.0	0.17	0.9
W-MT HILLERS	546.4	23.2	69.9	W-RESTING SPRINGS	34.4	0.17	0.9
W-MT PENNEL	502.8	23.2	69.9	W-QUAIL SPRING	88.4	0.16	0.8
W-LITTLE ROCKIES	42.7	23.2	69.9	W-ASHDOWN GORGE	337.9	0.16	0.8
W-GRANT RANGE	1042.3	23.0	69.3	W-PINE CANYON	503.6	0.16	0.8
W-RIORDANS WELL	228.0	23.0	69.3	W-RED CANYON S	239.0	0.15	0.8
W-MANCOS MESA	101.8	22.9	69.0	W-SWASEY MTN	820.5	0.15	0.8
W PARK RANGE	252.6	22.7	68.4	W-MCCULLOUGH MTS	306.6	0.15	0.8
W-CHEESE BOX CANYON	59.7	22.6	68.1	W-MUDDY MTNS	92.5	0.15	0.8
W-CROSS CYN	347.9	22.1	66.6	W-FANDANGO	1881.6	0.15	0.8
W-ROAD CYN	35.1	22.1	66.6	W-THE WALL	1606.2	0.15	0.8
W-FISH CREEK CYN	35.1	22.1	66.6	W-TOBIN RANGE	170.9	0.14	0.7
W-SQUAW PAPOOSE CYN	490.3	21.7	65.4	W-MT STIRLING	449.4	0.14	0.7
W-MULE CANYON	43.0	21.7	65.4	W-SILVER PK RANGE	926.1	0.14	0.7
W ARCH CANYON	189.3	21.7	65.4	W-FORTIFICATION	1136.3	0.14	0.7
W ANTELOPE	856.7	21.6	65.1	W-MT GRAFTON	1393.6	0.13	0.7
W CEDAR RIDGE	147.8	21.5	64.8	W-WEEPAH SPRING	1152.7	0.13	0.7
W-RED SPRING	147.8	21.5	64.8	W-PINE VALLEY MTN	3184.2	0.12	0.6
W MIDDLE POINT	54.2	21.2	63.9	W-CRACK CANYON	202.9	0.12	0.6
W SWEET ALICE CYN	27.0	21.1	63.6	W-MT HILLERS	546.4	0.12	0.6
W DARK CANYON	308.7	21.1	63.6	W-ARCH CANYON	189.3	0.12	0.6
W DARK-WOODENSHOE	140.8	21.1	63.6	W-NOTHING FLATS	79.8	0.12	0.6
W SLICKHORN CANYON	503.6	21.0	63.3	W-RED SPRING	147.8	0.11	0.6
W SHEIKS FLAT	468.1	21.0	63.3	W-DEEP CREEK MTNS	875.4	0.11	0.6
W-PINE CANYON	503.6	21.0	63.3	W-DESATOYA MTNS	728.1	0.11	0.6
W-GRAND GULCH	1688.6	21.0	63.3	W-FISH SPRINGS	681.6	0.10	0.5
W-BULLET CANYON	503.6	21.0	63.3	W-HANKS CREEK	365.6	0.10	0.5
W-FORTIFICATION	1136.3	20.9	63.0	W-STARVATION POINT	236.5	0.10	0.5
W-GABBS VALLEY	885.0	20.1	60.5	W-PIPPS DEATH	1179.5	0.10	0.5
W S REVEILLE	1170.1	20.0	60.2	W-MEDSGER PASS	98.0	0.10	0.5

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TABLE 4 3-5 PEAK YEAR PROJECTED POPULATION RELATED INCREASED WILDERNESS RESOURCE USE FOR ALTERNATIVE 3

NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-WAH WAH MTNS	187.4	20.0	60.2	W-ROCK CREEK	288.8	0.10	0.5
W-SILVER PK RANGE	926.1	19.9	59.9	W-FIDDLER BUTTE	22.7	0.09	0.5
W-FAR S EGAN	74.0	19.7	59.3	W-BLUE EAGLE	1511.7	0.09	0.5
W-S EGAN RANGE	219.3	19.2	57.8	W-AMARGOSA	79.8	0.09	0.5
W-MT GRAFTON	1393.6	19.2	57.8	W-E FORK HIGH ROCK	14.8	0.09	0.5
W-WHITE MTNS(FP)	1051.9	18.6	56.0	W-MUD SPRING	618.3	0.09	0.5
W-PIGEON SPRING	121.9	18.2	54.8	W-COTTONWOOD CYN	251.4	0.08	0.4
W-CONGER RANGE	1133.9	18.0	54.2	W-SIMPSON PARK	1230.2	0.08	0.4
W-GOSHUTE CANYON	1063.5	17.8	53.6	W-MORMON MTNS	687.4	0.08	0.4
W-WHITE ROCK RANGE	1032.4	17.6	53.0	W-DELAMAR MTNS	734.3	0.08	0.4
W-PARSNIP PEAK	197.9	17.6	53.0	W-RAWHIDE MTN	1524.4	0.08	0.4
W-BASALT	104.9	17.4	52.4	W-FACTORY BUTTE	254.0	0.07	0.4
W MONTONE MINE	58.2	17.4	52.4	W-KING TOP	941.3	0.07	0.4
W-EXCELSIOR	722.7	17.4	52.4	W-F & W 1	43.4	0.07	0.4
W KAWICH	1058.2	17.1	51.5	W-E. PAHRANAGAT	98.0	0.07	0.4
W-TABLE MOUNTAIN	144.4	17.1	51.5	W-QUEER MTN	887.8	0.07	0.4
W-WHITE ROCK RANGE	107.2	16.8	50.6	W-CALICO MTS	18.0	0.07	0.4
W-ARC DOME	455.8	16.4	49.4	W-INDIAN CREEK	15.8	0.06	0.3
W-QUEER MTN	887.8	16.0	48.2	W-QUINN, NORTH	1293.8	0.06	0.3
W-TUNNEL SPRING	1136.6	15.9	47.9	W-GOSHUTE CANYON	1063.5	0.06	0.3
W-HOWELL PEAK	812.9	15.5	46.7	W-BLUE HILLS	36.7	0.06	0.3
W-DEATH RIDGE	71.3	15.5	46.7	W-S REVEILLE	1170.1	0.06	0.3
W-KING TOP	941.3	15.5	46.7	W-GABBS VALLEY	885.0	0.06	0.3
W-WORTHINGTON MTNS	122.9	15.3	46.1	W-PALISADE MESA	1606.2	0.06	0.3
W-BONNIE CLAIRE	131.6	15.1	45.5	W-MEADOW VALLEY MTN	738.7	0.06	0.3
W-CENTRAL WAH WAH	112.4	15.0	45.2	W-AUGUSTA MTNS	697.3	0.06	0.3

*INDEX OF PRIMACY (PERCENTAGE OF LARGEST VALUE) CALCULATED WITH PERCENT INCREASE CTO156
+INDEX OF PRIMACY CALCULATED WITH INDEX OF V-D/ACRE

TABLE 4 3 6 PEAK YEAR PROJECTED POPULATION-RELATED INCREASED WILDERNESS RESOURCE USE FOR ALTERNATIVE 4

ALTERNATIVE 4 FULL DEPLOYMENT NEVADA/UTAH
BASE 1 BERYL, UTAH
BASE 2 COYOTE SPRING, NEV

NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*
W-COUGAR CANYON	180 2	32 5	100 0
W-PINE VALLEY MTN	3294 0	32 4	99 7
W-TAYLOR CREEK CYN	218 8	31 0	95 4
W-BEAR TRAP CANYON	218 8	31 0	95 4
W-LA VERKIN CREEK	218 8	31 0	95 4
W-ZION	9628 7	31 0	95 4
W-RED BUTTE	218 8	31 0	95 4
W-SPRING CANYON	245 0	30 1	92 6
W-GOOSE CREEK CYN	174 7	30 0	92 3
W-DEEP CREEK	349 5	30 0	92 3
W-ORDERVILLE CYN	1992 3	30 0	92 3
W-ASHDOWN GORGE	325 2	30 0	92 3
W-CEDAR BREAKS	325 2	30 0	92 3
W-N FORK VIRGIN R	908 8	30 0	92 3
W-FANDANGO	1736 1	29 9	92 0
W-BURNING HILLS	65 8	29 9	92 0
W-MOREY	1736 1	29 9	92 0
W-PARIA-HACKBERRY	500 5	29 8	91 7
W-RED MTN	252 2	28 9	88 9
W-STARVATION POINT	252 2	28 9	88 9
W-THE BLUES	125 2	28 9	88 9
W-HOWELL PEAK	1427 6	28 9	88 9
W-COTTONWOOD CYN	268 6	28 4	87 4
W-PARIA CYN	1469 9	28 3	87 1
W-CARCASS CANYON	90 1	28 2	86 8
W-HORSE SPRING CYN	90 1	28 2	86 8
W-RED CANYON N	259 3	28 0	86 2
W-BRYCE CANYON	266 8	27 9	85 8
W-E OF BRYCE	240 1	27 9	85 8
W-RED CANYON S	240 1	27 9	85 8
W-ESCALANTE 5	134 5	27 8	85 5
W-SCORPION	67 2	27 8	85 5
W-N ESCALANTE	6777 2	27 8	85 5
W-PARUNUWEAP CYN	2362 4	27 6	84 9
W-CANAAN MTN	381 1	27 6	84 9
W-THE WATCHMAN	190 5	27 6	84 9
W-PIPPS DEATH	1223 3	27 5	84 6
W-BOX DEATH HOLLOW	83 8	27 5	84 6
W-WAHWEEP	100 1	27 3	84 0
W-FIFTYMILE MTN	91 0	27 2	83 7
W-SIMPSON PARK	982 9	27 0	83 1
W-MOQUITH MTN	174 0	26 7	82 2
W-RAWHIDE MTN	1268 3	25 1	77 2
W-BLUE EAGLE	1252 3	24 8	76 3

NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-TAYLOR CREEK CYN	218 8	20 15	100 0
W-BEAR TRAP CANYON	218 8	17 63	87 5
W-GOOSE CREEK CYN	174 7	6 54	32 5
W-ORDERVILLE CYN	1992 3	3 79	18 8
W-N FORK VIRGIN R	908 8	2 91	14 4
W-TUNNEL SPRING	1259 8	1 35	6 7
W-BONELLI PEAK	526 2	1 33	6 6
W-GARROTT BUTTES	559 1	1 26	6 3
W-LA VERKIN CREEK	218 8	1 24	6 2
W-THE WATCHMAN	190 5	1 15	5 7
W-EL DORADO	820 6	1 07	5 3
W-IRETEBA PEAKS	711 0	1 01	5 0
W-E OF BRYCE	240 1	0 97	4 8
W-RED BUTTE	218 8	0 88	4 4
W-CROSS CYN	352 6	0 75	3 7
W-GRANT RANGE	827 3	0 74	3 7
W-SHEIKS FLAT	471 2	0 73	3 6
W-PINE CREEK	1015 2	0 67	3 3
W-ESCALANTE 5	134 5	0 64	3 2
W-GEM	106 8	0 53	2 6
W-EVERGREEN	138 7	0 45	2 2
W-COTTONWOOD-SALMON	280 1	0 40	2 0
W-NELLIS	145 1	0 39	1 9
W-LOWER PAHRANAGAT	138 7	0 38	1 9
W-DEEP CREEK	349 5	0 35	1 7
W-ROBERTS	1155 7	0 34	1 7
W-S PAHROCS/HIKO	1216 4	0 32	1 6
W-FREMONT GORGE	339 3	0 30	1 5
W-WHITE ROCK RANGE	971 0	0 29	1 4
W-MOREY	1736 1	0 29	1 4
W-BULLET CANYON	507 0	0 27	1 3
W-FISHLAKE MTN	278 1	0 26	1 3
W-CONGER RANGE	770 5	0 26	1 3
W-ZION	9628 7	0 26	1 3
W-PARIA CYN	1469 9	0 24	1 2
W-SQUAW PAPOOSE CYN	490 6	0 23	1 1
W-GRAND GULCH	1700 0	0 23	1 1
W-KAWICH	1170 5	0 23	1 1
W-WHITE ROCK RANGE	96 4	0 23	1 1
W-HONTONE MINE	63 9	0 22	1 1
W-CEDAR BREAKS	325 2	0 22	1 1
W-HOWELL PEAK	588 5	0 21	1 0
W-HOWELL PEAK	1427 6	0 21	1 0
W-BULL MTN	135 8	0 21	1 0

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NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-PALISADE MESA	1330 6	24 8	76 3	W-MARTIN SPRING	1020 3	0 21	1 0
W-THE WALL	1330 6	24 8	76 3	W N ESCALANTE	6777 2	0 20	1 0
W-QUINN NORTH	1214 4	23 7	72 9	W-UPPER MUDDY	98 5	0 20	1 0
W-LITTLE ROCKIES	42 4	23 1	71 1	W-PIGEON SPRING	137 9	0 19	0 9
W-MT HILLERS	542 6	23 1	71 1	W-WHITE MTNS(FP)	1173 7	0 18	0 9
W-MT PENNEL	499 6	23 0	70 8	W-DEATH VALLEY	905 3	0 18	0 9
W-MANOUS MESA	102 0	22 9	70 5	W-JUMBO SPRINGS	41 1	0 18	0 9
W-CHEESE BOX CANYON	59 7	22 6	69 5	W-SPRING CANYON	245 0	0 18	0 9
W-ROBERTS	1155 7	22 4	68 9	W-RESTING SPRINGS	53 7	0 18	0 9
W-CROSS CYN	352 6	22 4	68 9	W-PARUNUWEAP CYN	2362 4	0 18	0 9
W-QUAD CYN	35 6	22 3	68 6	W RED CANYON N	259 3	0 17	0 8
W-FISH CREEK CYN	35 6	22 3	68 6	W-PORTER MINE	104 5	0 17	0 8
W-JABBS VALLEY	979 4	21 8	67 1	W-QUAIL SPRING	145 7	0 17	0 8
W-ARCH CANYON	189 3	21 7	66 8	W-SO FISH CREEK	164 0	0 16	0 8
W-NOAW PAPOOSE CYN	490 6	21 7	66 8	W-MCCULLOUGH MTS	553 2	0 16	0 8
W-MULE CANYON	43 0	21 7	66 8	W-PINE CANYON	507 0	0 16	0 8
W-T REVEILLE	1300 7	21 7	66 8	W-MT STIRLING	749 9	0 15	0 7
W-SILVER PK RANGE	1031 4	21 7	66 8	W-RED CANYON S	240 1	0 15	0 7
W-WEEP ALICE CYN	27 6	21 5	66 2	W-SWASEY MTN	741 6	0 15	0 7
W-MIDDLE POINT	55 4	21 5	66 2	W-ASHDOWN GORGE	325 2	0 15	0 7
W-DARK CANYON	315 3	21 5	66 2	W-FANDANGO	1736 1	0 14	0 7
W-DARK WOODENSHOE	143 9	21 5	66 2	W-THE WALL	1330 6	0 14	0 7
W-GRAND GULCH	1700 0	21 2	65 2	W-SILVER PK RANGE	1031 4	0 14	0 7
W-FISH CANYON	507 0	21 2	65 2	W-WEEPAH SPRING	1251 0	0 13	0 6
W-BULLET CANYON	507 0	21 2	65 2	W-FORTIFICATION	848 5	0 13	0 6
W-HEIRS FLAT	471 2	21 2	65 2	W-CRACK CANYON	230 0	0 12	0 6
W-UNICORN CANYON	507 0	21 2	65 2	W-PINE VALLEY MTN	3294 0	0 12	0 6
W-WHEELER PEAK	585 3	20 9	64 3	W-ARCH CANYON	189 3	0 12	0 6
W-HIGHLAND RIDGE N	585 3	20 9	64 3	W-MT GRAFTON	1056 2	0 12	0 6
W-GRANT RANGE(USFS)	755 2	20 4	62 8	W-NOTHING FLATS	106 8	0 12	0 6
W-WHITE MTNS(FP)	1173 7	20 3	62 5	W-MT HILLERS	542 6	0 12	0 6
W-ANTELOPE	790 3	20 2	62 2	W-DESATOYA MTNS	673 0	0 11	0 5
W-PIGEON SPRING	137 9	20 1	61 8	W-DEEP CREEK MTNS	776 1	0 11	0 5
W-MARTIN SPRING	1020 3	19 7	60 6	W-MEDSGER PASS	138 7	0 11	0 5
W-GRANT RANGE	827 3	19 2	59 1	W RED SPRING	105 5	0 10	0 5
W-RICHARDS WELL	181 0	19 2	59 1	W-ROCK CREEK	271 9	0 10	0 5
W-LITTLE HUMBOLDT R	6 8	18 9	58 2	W-HANKS CREEK	244 9	0 10	0 5
W-EXCELSIOR	793 1	18 8	57 8	W FISH SPRINGS	617 4	0 10	0 5
W-BASALT	115 1	18 8	57 8	W-SAN RAFAEL REEF	175 0	0 10	0 5
W-HORTONE MINE	63 9	18 7	57 5	W PIPPS DEATH	1223 3	0 10	0 5
W-MT MORIAH	512 4	18 6	57 2	W-STARVATION POINT	252 2	0 10	0 5
W-GRANITE SPRINGS	170 8	18 6	57 2	W AMARGOSA	106 8	0 09	0 4
W-KAWICH	1170 5	18 5	56 9	W-SIDS MTN	245 6	0 09	0 4
W-DEER MTN	1021 0	18 0	55 4	W-MORMON MTNS	1080 4	0 08	0 4

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NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-FAR S EGAN	65.9	18.0	55.4	W-BLUE EAGLE	1252.3	0.08	0.4
W PARK RANGE	187.7	17.9	55.1	W-RAWHIDE MTN	1268.3	0.08	0.4
W TABLE MOUNTAIN	148.3	17.5	53.8	W-F & W 1	69.6	0.08	0.4
W-ARC DOME	493.5	17.5	53.8	W-COTTONWOOD CYN	268.6	0.08	0.4
W-TUNNEL SPRING	1259.8	17.3	53.2	W-DELAMAR MTNS	1045.6	0.08	0.4
W WHITE ROCK RANGE	971.0	17.2	52.9	W-MUD SPRING	558.9	0.08	0.4
W PARSNIP PEAK	186.2	17.2	52.9	W-E PAHRANAGAT	138.7	0.08	0.4
W BONNIE CLAIRE	152.7	17.1	52.6	W-FACTORY BUTTE	271.7	0.07	0.3
W-FORTIFICATION	848.5	16.9	52.0	W-KING TOP	681.4	0.07	0.3
W-WAH WAH MTNS	149.2	16.6	51.1	W-QUEER MTN	1021.0	0.07	0.3
W RED SPRING	105.5	16.3	50.2	W-SIMPSON PARK	982.9	0.07	0.3
W GRAPEVINE SPRING	659.3	16.3	50.2	W-MEADOW VALLEY MTN	1181.9	0.06	0.3
W-CEDAR RIDGE	105.5	16.3	50.2	W-GABBS VALLEY	979.4	0.06	0.3
W WORTHINGTON MTNS	132.0	16.2	49.8	W-GOSHUTE CANYON	617.1	0.06	0.3
W WHITE ROCK RANGE	96.4	15.8	48.6	W-MILLION HILLS	58.6	0.06	0.3
W S EGAN RANGE	166.2	15.7	48.3	W-S REVEILLE	1300.7	0.06	0.3
W MT GRAFTON	1056.2	15.7	48.3	W-QUINN, NORTH	1214.4	0.06	0.3
W-WEEPAH SPRING	1251.0	15.6	48.0	W-BRIDGER PASS MESA	16.4	0.06	0.3

*INDEX OF PRIMACY (PERCENTAGE OF LARGEST VALUE) CALCULATED WITH PERCENT INCREASE CT 0157
+INDEX OF PRIMACY CALCULATED WITH INDEX OF V-D/ACRE

TABLE 4.3.7 PEAK YEAR PROJECTED POPULATION-RELATED WILDERNESS RESOURCE USE FOR ALTERNATIVE 5

ALTERNATIVE 5 FULL DEPLOYMENT NEVADA/UTAH
BASE 1 MILFORD, UTAH
BASE 2 ELY, NEV

NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-MOREY	2052.6	33.6	100.0	W-TAYLOR CREEK CYN	217.8	20.13	100.0
W-FANDANGO	2052.6	33.6	100.0	W-BEAR TRAP CANYON	217.8	17.61	87.5
W-SIMPSON PARK	1259.2	32.2	95.8	W-GOOSE CREEK CYN	179.8	6.60	32.8
W-BURNING HILLS	72.0	31.8	94.6	W-ORDERVILLE CYN	2050.7	3.83	19.0
W-PINE VALLEY MTN	3083.7	31.0	92.3	W-N FORK VIRGIN R	935.4	2.94	14.6
W-TAYLOR CREEK CYN	217.8	30.9	92.0	W-MORMON MTNS	671.3	1.37	6.8
W-RED BUTTE	217.8	30.9	92.0	W-TUNNEL SPRING	1094.2	1.32	6.6
W-ZION	9582.5	30.9	92.0	W-LA VERKIN CREEK	217.8	1.24	6.2
W-PARIA-HACKBERRY	526.3	30.9	92.0	W-BONELLI PEAK	255.1	1.24	6.2
W-BEAR TRAP CANYON	217.8	30.9	92.0	W-DISASTER PK	38.9	1.23	6.1
W-LA VERKIN CREEK	217.8	30.9	92.0	W-GARROTT BUTTES	271.1	1.18	5.9
W-ORDERVILLE CYN	2050.7	30.6	91.1	W-THE WATCHMAN	182.5	1.14	5.7
W-DEEP CREEK	359.8	30.6	91.1	W-E OF BRYCE	271.6	1.01	5.0
W-GOOSE CREEK CYN	179.8	30.6	91.1	W-EL DORADO	406.2	1.00	5.0
W-N FORK VIRGIN R	935.4	30.6	91.1	W-ROCKWELL	542.9	0.94	4.7
W-HORSE SPRING CYN	101.1	30.5	90.8	W-IRETEBA PEAKS	351.0	0.94	4.7
W-CARCASS CANYON	101.1	30.5	90.8	W-RED BUTTE	217.8	0.88	4.4
W-BRYCE CANYON	301.8	30.5	90.8	W-GRANT RANGE	1075.9	0.78	3.9
W-RED CANYON S	271.6	30.4	90.5	W-CROSS CYN	347.7	0.74	3.7
W-E OF BRYCE	271.6	30.4	90.5	W-SHEIKS FLAT	472.3	0.73	3.6
W-N ESCALANTE	7556.2	30.0	89.3	W-ESCALANTE 5	149.9	0.66	3.3
W-RAWHIDE MTN	1624.5	30.0	89.3	W-PINE CREEK	502.9	0.62	3.1
W-ESCALANTE 5	149.9	30.0	89.3	W-AMARGOSA	80.9	0.52	2.6
W-SCORPION	74.9	30.0	89.3	W-JARBIDGE ADDITION	159.5	0.52	2.6
W-WHEELER PEAK	921.9	29.9	89.0	W-EVERGREEN	98.0	0.42	2.1
W-HIGHLAND RIDGE,N	921.9	29.9	89.0	W-COTTONWOOD-SALMON	450.6	0.41	2.0
W-HOWELL PEAK	1487.3	29.8	88.7	W-NELLIS	73.7	0.37	1.8
W-THE BLUES	130.5	29.8	88.7	W-ROBERTS	1541.7	0.37	1.8
W-BLUE EAGLE	1611.8	29.6	88.7	W-LOWER PAHRANAGAT	98.0	0.36	1.8
W-PALISADE MESA	1712.6	29.8	88.7	W-DEEP CREEK	359.8	0.35	1.7
W-THE WALL	1712.6	29.8	88.7	W-FREMONT GORGE	490.6	0.31	1.5
W-MARTIN SPRING	1721.2	29.3	87.2	W-S PAHROCS/HIKO	957.3	0.31	1.5
W-PARIA CYN	1535.0	29.2	86.9	W-MOREY	2052.6	0.30	1.5
W-ROBERTS	1541.7	27.8	82.7	W-WHITE ROCK RANGE	879.4	0.28	1.4
W-ASHDOWN GORGE	290.8	27.7	82.4	W-CONGER RANGE	1322.3	0.28	1.4
W-RED CANYON N	255.3	27.7	82.4	W-BULLET CANYON	508.1	0.27	1.3
W-BEAR BREAKS	290.8	27.7	82.4	W-FISHLAKE MTN	402.2	0.27	1.3
W-COUGAR CANYON	133.8	27.6	82.1	W-ZION	9582.5	0.26	1.3
W-WAHWEAP	98.0	26.9	80.1	W-PARIA CYN	1535.0	0.25	1.2
W-THE WATCHMAN	182.5	26.8	79.8	W-MARTIN SPRING	1721.2	0.24	1.2
W-PAUNUWEAP CYN	2263.2	26.8	79.8	W-SQUAW PAPOOSE CYN	503.0	0.24	1.2
W-CANAAN MTN	365.1	26.8	79.8	W-KAWICH	1090.6	0.23	1.1

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NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
[illegible] MTN	89 0	26 8	79 8	W-GRAND GULCH	1703 7	0 23	1 1
[illegible] MTN	225 3	26 7	79 5	W-WHITE ROCK RANGE	88 5	0 23	1 1
[illegible] POINT	225 3	26 7	79 5	W-CEDAR BREAKS	290 8	0 22	1 1
[illegible] MTN	173 0	26 6	79 2	W-HONTONE MINE	62 9	0 22	1 1
[illegible]	1094 5	26 5	78 9	W-HOWELL PEAK	974 5	0 22	1 1
[illegible]	75 0	26 5	78 9	W-HOWELL PEAK	1407 3	0 21	1 0
[illegible]	240 0	26 2	78 0	W-N ESCALANTE	7556 2	0 21	1 0
[illegible]	254 4	25 9	77 1	W-UPPER MUDDY	105 2	0 21	1 0
MT MORIAH	763 0	25 9	77 1	W-LITTLE GOOSE CR	101 7	0 20	1 0
[illegible]	196 2	25 6	76 2	W-BIRDSEYE	587 1	0 20	1 0
[illegible]	1342 3	25 5	75 9	W-PIGEON SPRING	132 9	0 19	0 9
[illegible]	9 4	24 4	72 6	W-PARUNUWEAP CYN	2263 2	0 18	0 9
[illegible]	952 8	24 4	72 6	W-DEATH VALLEY	728 5	0 18	0 9
MAUDS MESA	109 6	24 2	72 0	W-SO FISH CREEK	178 8	0 17	0 8
[illegible]	64 0	23 8	70 8	W-RESTING SPRINGS	34 0	0 17	0 8
[illegible]	235 4	23 6	70 2	W SPRING CANYON	196 2	0 17	0 8
[illegible]	1075 9	23 6	70 2	W-PORTER MINE	84 1	0 17	0 8
[illegible]	225 2	23 6	70 2	W-RED CANYON N	255 3	0 17	0 8
[illegible]	43 3	23 4	69 6	W-JUMBO SPRINGS	19 9	0 17	0 8
[illegible]	510 2	23 4	69 6	W-WHITE MTNS(FP)	1131 8	0 17	0 8
[illegible]	554 5	23 4	69 6	W-PINE CANYON	508 1	0 16	0 8
FAIR RANGE	258 5	23 1	68 8	W-QUAIL SPRING	74 0	0 16	0 8
ANTELOPE	907 9	22 6	67 3	W-RED CANYON S	271 6	0 16	0 8
[illegible] PAPOOSE CYN	503 0	22 1	65 8	W-NEPHI	543 4	0 16	0 8
[illegible]	44 1	22 1	65 8	W-SWASEY MTN	995 0	0 15	0 7
ARCH CANYON	194 2	22 1	65 8	W-ASHDOWN GORGE	290 8	0 15	0 7
FISH CREEK CYN	35 2	22 1	65 8	W-THE WALL	1712 6	0 15	0 7
ROAD CYN	35 2	22 1	65 8	W-FANDANGO	2052 6	0 15	0 7
[illegible]	347 7	22 1	65 8	W-MCCULLOUGH MTS	272 2	0 15	0 7
CEDAR RIDGE	149 1	21 6	64 3	W-DUGWAY MTNS	93 8	0 15	0 7
RED SPRING	149 1	21 6	64 3	W-SILVER PK RANGE	998 8	0 14	0 7
FORTIFICATION	1137 5	21 4	63 7	W-MT STIRLING	443 2	0 14	0 7
GABBS VALLEY	956 3	21 4	63 7	W-CRACK CANYON	349 5	0 13	0 6
SILVERHORN CANYON	508 1	21 2	63 1	W MT GRAFTON	1420 2	0 13	0 6
[illegible]	472 3	21 2	63 1	W-FORTIFICATION	1137 5	0 13	0 6
PINE CANYON	508 1	21 2	63 1	W-WEEPAH SPRING	1105 6	0 13	0 6
GRAND GULCH	1703 7	21 2	63 1	W-PINE VALLEY MTN	3083 7	0 12	0 6
BULLET CANYON	508 1	21 2	63 1	W-MT HILLERS	554 5	0 12	0 6
SILVER PK RANGE	998 8	21 2	63 1	W-ARCH CANYON	194 2	0 12	0 6
MIDDLE POINT	53 2	20 9	62 2	W-GEM	80 9	0 12	0 6
DARK CANYON	303 3	20 9	62 2	W-DESATOYA MTNS	752 8	0 11	0 5
CORNER RANGE	1322 3	20 9	62 2	W DEEP CREEK MTNS	995 3	0 11	0 5

NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-PARK-WOODENSHOE	138 4	20 9	62 2	W-RED SPRING	149 1	0 11	0 5
W-SWEET ALICE CYN	26 6	20 8	61 9	W-FISH SPRINGS	776 1	0 10	0 5
W-S REVEILLE	1180 1	20 1	59 8	W-SAN RAFAEL REEF	186 3	0 10	0 5
W-FAR S EGAN	75 7	20 1	59 8	W-MEDSGER PASS	98 0	0 10	0 5
W-S EGAN RANGE	223 4	20 0	59 5	W-LIME CANYON	53 7	0 10	0 5
W-MT GRAFTON	1420 2	20 0	59 5	W-STARVATION POINT	225 3	0 10	0 5
W-WHITE MTNS(FP)	1131 8	19 7	58 6	W-HANKS CREEK	370 5	0 10	0 5
W-PIGEON SPRING	132 9	19 5	58 0	W-ROCK CREEK	299 1	0 10	0 5
W-EXCELSIOR	780 2	18 5	55 1	W-PIPPS DEATH	1094 5	0 10	0 5
W-BASALT	113 3	18 5	55 1	W-MUD SPRING	749 8	0 09	0 4
W-MONTONE MINE	62 9	18 5	55 1	W-BLUE EAGLE	1611 8	0 09	0 4
W-KING TOP	1128 3	18 4	54 8	W-SIDS MTN	262 4	0 09	0 4
W-HOWELL PEAK	974 5	18 4	54 8	W-N F LIT HUMBOLDT	194 1	0 08	0 4
W-DEATH RIDGE	85 5	18 4	54 8	W-SIMPSON PARK	1259 2	0 08	0 4
W-GOSHUTE CANYON	1065 2	17 8	53 0	W-FIDDLER BUTTE	28 6	0 08	0 4
W-TABLE MOUNTAIN	149 8	17 6	52 4	W-COTTONWOOD CYN	240 0	0 08	0 4
W-CENTRAL WAH WAH	135 2	17 5	52 1	W-RAWHIDE MTN	1624 5	0 08	0 4
W-RAWICH	1090 6	17 5	52 1	W-DELAMAR MTNS	725 4	0 08	0 4
W-ARC DOME	481 0	17 2	51 2	W-F & W 1	43 7	0 07	0 3
W-QUEER MTN	960 3	17 1	50 9	W-QUEER MTN	960 3	0 07	0 3
W-BONNIE CLAIRE	142 3	16 1	47 9	W-FACTORY BUTTE	390 8	0 07	0 3
W-PARSNIP PEAK	168 6	15 9	47 3	W-KING TOP	1128 3	0 07	0 3
W-WHITE ROCK RANGE	879 4	15 9	47 3	W-E PAHRANAGAT	98 0	0 07	0 3
W-TUNNEL SPRING	1094 2	15 4	45 8	W-AUGUSTA MTNS	735 3	0 06	0 3

*INDEX OF PRIMACY (PERCENTAGE OF LARGEST VALUE) CALCULATED WITH PERCENT INCREASE CT 0158
+INDEX OF PRIMACY CALCULATED WITH INDEX OF V-D/ACRE

TABLE 4 3-8 PEAK YEAR PROJECTED POPULATION RELATED INCREASED WILDERNESS RESOURCE USE FOR ALTERNATIVE 6

ALTERNATIVE 6 FULL DEPLOYMENT NEVADA/UTAH
BASE 1 MILFORD, UTAH
BASE 2 COYOTE SPRING, NEV

NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-MOREY	1763.2	30.3	100.0	W-TAYLOR CREEK CYN	205.2	19.77	100.0
W-FANDANGO	1763.2	30.3	100.0	W-BEAR TRAP CANYON	205.2	17.29	87.5
W-BEAR TRAP CANYON	205.2	29.7	98.0	W-GOOSE CREEK CYN	168.6	6.48	32.8
W-LA VERKIN CREEK	205.2	29.7	98.0	W-ORDERVILLE CYN	1922.2	3.75	19.0
W-RED BUTTE	205.2	29.7	98.0	W-N FORK VIRGIN R	876.8	2.88	14.6
W-TAYLOR CREEK CYN	205.2	29.7	98.0	W-BONELLI PEAK	487.3	1.32	6.7
W-ZION	9028.1	29.7	98.0	W-TUNNEL SPRING	1104.6	1.32	6.7
W-PINE VALLEY MTN	2902.9	29.7	98.0	W-GARROTT BUTTES	517.8	1.26	6.4
W-BURNING HILLS	64.7	29.6	97.7	W-LA VERKIN CREEK	205.2	1.22	6.2
W-PARIA HACKBERRY	493.5	29.5	97.4	W-THE WATCHMAN	183.0	1.14	5.8
W-DEEP CREEK	337.2	29.3	96.7	W-EL DORADO	769.1	1.07	5.4
W-ORDERVILLE CYN	1922.2	29.3	96.7	W-IRETEBA PEAKS	667.2	1.01	5.1
W-GOOSE CREEK CYN	168.6	29.3	96.7	W-E OF BRYCE	243.5	0.97	4.9
W-N FORK VIRGIN R	876.8	29.3	96.7	W-RED BUTTE	205.2	0.86	4.4
W-ASHDOWN GORGE	306.7	28.8	95.0	W-CROSS CYN	346.8	0.74	3.7
W-CEDAR BREAKS	306.7	28.8	95.0	W-GRANT RANGE	824.2	0.74	3.7
W-HORSE SPRING CYN	92.1	28.6	94.4	W-SHEIKS FLAT	472.4	0.73	3.7
W-CARCASS CANYON	92.1	28.6	94.4	W-PINE CREEK	950.2	0.66	3.3
W-HOWELL PEAK	1404.8	28.6	94.4	W-ESCALANTE 5	137.3	0.64	3.2
W-THE BLUES	123.2	28.6	94.4	W-GEM	101.9	0.53	2.7
W-COUGAR CANYON	149.1	28.5	94.1	W-EVERGREEN	135.8	0.44	2.2
W-SIMPSON PARK	1080.3	28.4	93.7	W-NELLIS	135.7	0.39	2.0
W-SCORPION	68.6	28.2	93.1	W-LOWER PAHRANAGAT	135.8	0.37	1.9
W-N ESCALANTE	6919.3	28.2	93.1	W-ROBERTS	1247.3	0.35	1.8
W-ESCALANTE 5	137.3	28.2	93.1	W-DEEP CREEK	337.2	0.35	1.8
W-RED CANYON N	261.7	28.2	93.1	W-S PAHROCS/HIKO	1231.8	0.32	1.6
W-RED CANYON S	243.5	28.2	93.1	W-FREMONT GORGE	393.3	0.30	1.5
W-E OF BRYCE	243.5	28.2	93.1	W-MOREY	1763.2	0.29	1.5
W-BRYCE CANYON	270.6	28.2	93.1	W-WHITE ROCK RANGE	800.6	0.28	1.4
W-PARIA CYN	1451.9	28.0	92.4	W-BULLET CANYON	508.2	0.27	1.4
W-PIPPS DEATH	1219.6	27.4	90.4	W-FISHLAKE MTN	322.2	0.27	1.4
W-BOX DEATH HOLLOW	83.5	27.4	90.4	W-ZION	9028.1	0.25	1.3
W-RED MTN	228.6	27.0	89.1	W-CONGER RANGE	808.9	0.25	1.3
W-STARVATION POINT	228.6	27.0	89.1	W-PARIA CYN	1451.9	0.24	1.2
W-PARUNUWEAP CYN	2268.8	26.8	88.4	W-WHITE ROCK RANGE	73.5	0.23	1.2
W-CANAAN MTN	366.0	26.8	88.4	W-KAWICH	1142.8	0.23	1.2
W-THE WATCHMAN	183.0	26.8	88.4	W-SQUAW PAPOOSE CYN	493.5	0.23	1.2
W-COTTONWOOD CYN	246.1	26.7	88.1	W-GRAND GULCH	1704.0	0.23	1.2
W-SPRING CANYON	206.2	26.6	87.8	W-CEDAR BREAKS	306.7	0.22	1.1
W-FIFTYMILE MTN	88.0	26.6	87.8	W-MARTIN SPRING	1054.0	0.22	1.1
W-WAHWEEP	96.7	26.6	87.8	W-HONTONE MINE	62.4	0.22	1.1
W-MOQUITH MTN	169.9	26.2	86.5	W-BULL MTN	132.8	0.21	1.1
W-RAWHIDE MTN	1275.2	25.2	83.2	W-HOWELL PEAK	1404.8	0.21	1.1
W-THE WALL	1337.9	24.9	82.2	W-HOWELL PEAK	616.9	0.21	1.1

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NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-PALISADE MESA	1337 9	24 9	82 2	W-UPPER MUDDY	97 1	0 20	1 0
W-BLUE EAGLE	1259 3	24 9	82 2	W-N ESCALANTE	6919 3	0 20	1 0
W-MT PENNEL	512 8	23 5	77 6	W-PIGEON SPRING	135 8	0 19	1 0
W-LITTLE ROCKIES	43 5	23 5	77 6	W-PARUNUWEAP CYN	2268 8	0 18	0 9
W-MT HILLERS	557 0	23 5	77 6	W-DEATH VALLEY	892 4	0 18	0 9
W-ROBERTS	1247 3	23 3	76 9	W-JUMBO SPRINGS	38 1	0 18	0 9
W-MANCOS MESA	104 3	23 3	76 9	W-WHITE MTNS(FP)	1154 3	0 17	0 9
W-QUINN, NORTH	1179 1	23 2	76 6	W-PORTER MINE	103 0	0 17	0 9
W-CHEESE BOX CANYON	60 9	23 0	75 9	W-SPRING CANYON	206 2	0 17	0 9
W-CROSS CYN	346 8	22 1	72 9	W-RESTING SPRINGS	51 4	0 17	0 9
W-ROAD CYN	35 0	22 0	72 6	W-RED CANYON N	261 7	0 17	0 9
W-FISH CREEK CYN	35 0	22 0	72 6	W-QUAIL SPRING	132 3	0 17	0 9
W-MULE CANYON	43 3	21 8	71 9	W-MCCULLOUGH MTS	520 0	0 16	0 8
W-ARCH CANYON	190 5	21 8	71 9	W-RED CANYON S	243 5	0 16	0 8
W-SQUAW PAPOOSE CYN	493 5	21 8	71 9	W-PINE CANYON	508 2	0 16	0 8
W-GABBS VALLEY	968 2	21 6	71 3	W-MT STIRLING	713 5	0 15	0 8
W-SILVER PK RANGE	1013 8	21 4	70 6	W-ASHDOWN GORGE	306 7	0 15	0 8
W-SWEET ALICE CYN	27 3	21 3	70 3	W-SWASEY MTN	775 5	0 15	0 8
W-MIDDLE POINT	54 7	21 3	70 3	W-SILVER PK RANGE	1013 8	0 14	0 7
W-DARK CANYON	311 4	21 3	70 3	W-THE WALL	1337 9	0 14	0 7
W-DARK-WOODENSHOE	142 1	21 3	70 3	W-SIDS MTN	242 0	0 14	0 7
W-GRAND GULCH	1704 0	21 2	70 0	W-FANDANGO	1763 2	0 14	0 7
W-SLICKHORN CANYON	508 2	21 2	70 0	W-FORTIFICATION	813 4	0 13	0 7
W-SHEIKS FLAT	472 4	21 2	70 0	W-ROCKWELL	413 1	0 13	0 7
W-BULLET CANYON	508 2	21 2	70 0	W-WEEPAH SPRING	1209 3	0 13	0 7
W-PINE CANYON	508 2	21 2	70 0	W-CRACK CANYON	276 4	0 13	0 7
W-S REVEILLE	1244 8	21 0	69 3	W-MT HILLERS	557 0	0 12	0 6
W-WHEELER PEAK	580 4	20 8	68 6	W-PINE VALLEY MTN	2902 9	0 12	0 6
W-HIGHLAND RIDGE, N	580 4	20 8	68 6	W-MT GRAFTON	1021 4	0 12	0 6
W-GRANT RANGE(USFS)	752 7	20 3	67 0	W-NOTHING FLATS	101 9	0 12	0 6
W-WHITE MTNS(FP)	1154 3	20 1	66 3	W-ARCH CANYON	190 5	0 12	0 6
W-LITTLE HUMBOLDT R	7 4	19 8	65 3	W-DESATOYA MTNS	632 1	0 11	0 6
W-MARTIN SPRING	1054 0	19 8	65 3	W-DEEP CREEK MTNS	769 9	0 11	0 6
W-PIGEON SPRING	135 8	19 8	65 3	W-MEDSGER PASS	135 8	0 11	0 6
W-PARK RANGE	209 8	19 2	63 4	W-RED SPRING	116 2	0 10	0 5
W-GRANT RANGE	824 2	19 1	63 0	W-ROCK CREEK	268 1	0 10	0 5
W-ANTELOPE	736 9	19 1	63 0	W-STARVATION POINT	228 6	0 10	0 5
W-RIORDANS WELL	180 3	19 1	63 0	W-HANKS CREEK	263 0	0 10	0 5
W-BASALT	112 4	18 4	60 7	W-PIPPS DEATH	1219 6	0 10	0 5
W-EXCELSIOR	774 4	18 4	60 7	W-FISH SPRINGS	607 2	0 10	0 5
W-HONTONE MINE	62 4	18 4	60 7	W-AMARGOSA	101 9	0 09	0 5
W-GRANITE SPRINGS	172 7	18 3	60 4	W-BLUE EAGLE	1259 3	0 08	0 4
W-MT MORIAH	518 0	18 3	60 4	W-MUD SPRING	584 4	0 08	0 4
W-KAWICH	1142 8	18 2	60 1	W-DELAMAR MTNS	1014 4	0 08	0 4

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TABLE 4 3-8 PEAK YEAR PROJECTED POPULATION RELATED INCREASED WILDERNESS RESOURCE USE FOR ALTERNATIVE 6

NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-QUEER MTN	1003 1	17 8	58 7	W-E PAHRANAGAT	135 8	0 08	0 4
W-CEDAR RIDGE	116 2	17 3	57 1	W-RAWHIDE MTN	1275 2	0 08	0 4
W-RED SPRING	116 2	17 3	57 1	W-N F LIT HUMBOLDT	159 4	0 08	0 4
W-ARC DOME	481 7	17 2	56 8	W-SIMPSON PARK	1080 3	0 08	0 4
W-BONNIE CLAIRE	150 1	16 9	55 8	W-F & W 1	67 7	0 08	0 4
W-WAH WAH MTNS	148 0	16 9	55 8	W-MORMON MTNS	1028 0	0 08	0 4
W-FAR S EGAN	60 5	16 7	55 1	W-COTTONWOOD CYN	246 1	0 08	0 4
W-FORTIFICATION	813 4	16 3	53 8	W-KING TOP	714 2	0 07	0 4
W-TABLE MOUNTAIN	136 4	16 3	53 8	W-FACTORY BUTTE	314 5	0 07	0 4
W-WORTHINGTON MTNS	127 0	15 7	51 8	W-COTTONWOOD-SALMON	296 1	0 07	0 4
W-TUNNEL SPRING	1104 6	15 5	51 2	W-QUEER MTN	1003 1	0 07	0 4
W-S EGAN RANGE	160 7	15 3	50 5	W-DEVILS CYN	242 0	0 06	0 3
W MT GRATION	1021 4	15 3	50 5	W-AUGUSTA MTNS	628 8	0 06	0 3
W-WEEPAH SPRING	1209 3	15 2	50 2	W-MEADOW VALLEY MTN	1150 7	0 06	0 3

*INDEX OF PRIMACY (PERCENTAGE OF LARGEST VALUE) CALCULATED WITH PERCENT INCREASE

+INDEX OF PRIMACY CALCULATED WITH INDEX OF V-D/ACRE

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TABLE 4 3-9 PEAK YEAR PROJECTED POPULATION-RELATED INCREASED WILDERNESS RESOURCE USE FOR ALTERNATIVE 8A

ALTERNATIVE 8A SPLIT BASING DEPLOYMENT NV/UT PART
BASE 1 COYOTE SPRING, NEV
BASE 2 CLOVIS, N MEX

NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-TAYLOR CREEK CYN	188.4	27.9	100.0	W-TAYLOR CREEK CYN	188.4	19.29	100.0
W-ZION	8289.8	27.9	100.0	W-BEAR TRAP CANYON	188.4	16.87	87.5
W-LA VERKIN CREEK	188.4	27.9	100.0	W-GOOSE CREEK CYN	152.3	6.29	32.6
W-RED BUTTE	188.4	27.9	100.0	W-ORDERVILLE CYN	1736.9	3.65	18.9
W-BEAR TRAP CANYON	188.4	27.9	100.0	W-N FORK VIRGIN R	792.3	2.80	14.5
W-PINE VALLEY MTN	2579.6	27.3	97.8	W-TUNNEL SPRING	1080.7	1.32	6.8
W-N FORK VIRGIN R	792.3	27.2	97.5	W-BONELLI PEAK	598.9	1.30	6.7
W-GOOSE CREEK CYN	152.3	27.2	97.5	W-GARROTT BUTTES	636.3	1.23	6.4
W-ORDERVILLE CYN	1736.9	27.2	97.5	W-LA VERKIN CREEK	188.4	1.19	6.2
W-DEEP CREEK	304.7	27.2	97.5	W-THE WATCHMAN	180.4	1.13	5.9
W-RED MTN	230.4	27.1	97.1	W-EL DORADO	967.2	1.04	5.4
W-COTTONWOOD CYN	251.9	27.1	97.1	W-IRETEBA PEAKS	837.0	0.98	5.1
W-STARVATION POINT	230.4	27.1	97.1	W-E OF BRYCE	207.5	0.93	4.8
W-PARIA CYN	1349.9	26.6	95.3	W-RED BUTTE	188.4	0.84	4.4
W-ASHDOWN GORGE	274.6	26.6	95.3	W-CROSS CYN	337.3	0.74	3.8
W-CEDAR BREAKS	274.6	26.6	95.3	W-SHEIKS FLAT	459.5	0.72	3.7
W-THE WATCHMAN	180.4	26.5	95.0	W-GRANT RANGE	583.1	0.68	3.5
W-PARUNUWEAP CYN	2236.8	26.5	95.0	W-PINE CREEK	1200.1	0.65	3.4
W-CANAAN MTN	360.8	26.5	95.0	W-ESCALANTE 5	119.0	0.62	3.2
W-SPRING CANYON	191.6	26.4	94.6	W-GEM	71.2	0.50	2.6
W-COUGAR CANYON	125.9	26.4	94.6	W-EVERGREEN	177.7	0.45	2.3
W-PARIA-HACKBERRY	421.3	26.3	94.3	W-NELLIS	171.7	0.38	2.0
W-NAHNEEP	92.9	25.9	92.8	W-LOWER PAHRANAGAT	177.7	0.38	2.0
W-HOWELL PEAK	1217.5	25.8	92.5	W-DEEP CREEK	304.7	0.34	1.8
W-THE BLUES	106.8	25.8	92.5	W-S PAHROCS/HIKO	1412.3	0.32	1.7
W-FIFTYMILE MTN	84.5	25.8	92.5	W-ROBERTS	347.7	0.28	1.5
W-BURNING HILLS	53.4	25.7	92.1	W-WHITE ROCK RANGE	844.8	0.28	1.5
W-CARCASS CANYON	79.0	25.6	91.8	W-BULLET CANYON	494.4	0.27	1.4
W-HORSE SPRING CYN	79.0	25.6	91.8	W-ZION	8289.8	0.25	1.3
W-MOQUITH MTN	162.8	25.4	91.0	W-CONGER RANGE	492.3	0.24	1.2
W-ESCALANTE 5	119.0	25.4	91.0	W-PARIA CYN	1349.9	0.24	1.2
W-N ESCALANTE	5995.6	25.4	91.0	W-SQUAW PAPOOSE CYN	474.3	0.23	1.2
W-SCORPION	59.4	25.4	91.0	W-MOREY	682.1	0.23	1.2
W-RED CANYON N	211.9	25.2	90.3	W-GRAND GULCH	1657.5	0.23	1.2
W-E OF BRYCE	207.5	25.1	90.0	W-WHITE ROCK RANGE	59.9	0.22	1.1
W-RED CANYON S	207.5	25.1	90.0	W-KAWICH	737.9	0.21	1.1
W-BRYCE CANYON	230.5	25.1	90.0	W-CEDAR BREAKS	274.6	0.21	1.1
W-PIPPS DEATH	1013.5	25.0	89.6	W-HOWELL PEAK	1217.5	0.20	1.0
W-BOX DEATH HOLLOW	69.4	25.0	89.6	W-HOWELL PEAK	372.7	0.20	1.0
W-MANLOS MESA	94.5	21.6	77.4	W-HONTONE MINE	31.8	0.20	1.0
W-CROSS CYN	337.3	21.6	77.4	W-N ESCALANTE	5995.6	0.20	1.0

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NAME	VISITOR DAY DIFFERENCE	PERCENT INCREASE	INDEX OF PRIMACY*	NAME	VISITOR DAY DIFFERENCE	VD/ACRE INDEX (X2)	INDEX OF PRIMACY+
W-MT HILLERS	495.1	21.5	77.1	W-MARTIN SPRING	644.3	0.19	1.0
W-ROAD CYN	34.0	21.5	77.1	W-JOB PEAK	235.6	0.19	1.0
W-FISH CREEK CYN	34.0	21.5	77.1	W-PIGEON SPRING	74.1	0.18	0.9
W-MT PENNEL	456.1	21.5	77.1	W-PARUNUWEAP CYN	2236.8	0.18	0.9
W-LITTLE ROCKIES	38.6	21.4	76.7	W-JUMBO SPRINGS	46.8	0.17	0.9
W-CHEESE BOX CANYON	55.5	21.4	76.7	W-QUAIL SPRING	166.0	0.17	0.9
W-MULE CANYON	41.6	21.1	75.6	W-DEATH VALLEY	574.8	0.17	0.9
W-ARCH CANYON	183.1	21.1	75.6	W-RESTING SPRINGS	44.5	0.17	0.9
W-SQUAW PAPOOSE CYN	474.3	21.1	75.6	W-PORTER MINE	66.4	0.16	0.8
W-SWEET ALICE CYN	26.8	21.0	75.3	W-PINE CANYON	494.4	0.16	0.8
W-MIDDLE POINT	53.7	21.0	75.3	W-SPRING CANYON	191.6	0.16	0.8
W DARK CANYON	305.8	21.0	75.3	W-WHITE MTNS(EP)	616.2	0.16	0.8
W-DARK-WOODENSHOE	139.5	21.0	75.3	W-RED CANYON N	211.9	0.15	0.8
W-BULLET CANYON	494.4	20.7	74.2	W-ASHDOWN GORGE	274.6	0.15	0.8
W-GRAND GULCH	1657.5	20.7	74.2	W-RED CANYON S	207.5	0.15	0.8
W-PINE CANYON	494.4	20.7	74.2	W-MCCULLOUGH MTS	650.3	0.15	0.8
W-SHEIKS FLAT	459.5	20.7	74.2	W-SWASEY MTN	545.7	0.14	0.7
W-SLICKHORN CANYON	494.4	20.7	74.2	W-MT STIRLING	686.1	0.14	0.7
W-FAR S EGAN	55.9	15.7	56.3	W-WEEPAH SPRING	1261.8	0.13	0.7
W WEEPAH SPRING	1261.8	15.7	56.3	W-GOSHUTE CANYON	363.5	0.13	0.7
W-WORTHINGTON MTNS	124.9	15.5	55.6	W-SILVER PK RANGE	542.6	0.13	0.7
W-FORTIFICATION	767.5	15.5	55.6	W-MT GRAFTON	916.8	0.12	0.6
W-WHITE ROCK RANGE	844.8	15.3	54.8	W-THE WALL	644.5	0.12	0.6
W-GRANT RANGE(USFS)	515.1	15.3	54.8	W-ARCH CANYON	183.1	0.12	0.6
W PARSNIP PEAK	162.0	15.3	54.8	W-MT HILLERS	495.1	0.12	0.6
W-TABLE MOUNTAIN	125.5	15.2	54.5	W-FORTIFICATION	767.5	0.12	0.6
W-S PAHROCS/HIKO	1412.3	15.2	54.5	W-NOTHING FLATS	71.2	0.11	0.6
W-TUNNEL SPRING	1080.7	15.2	54.5	W-MEDSGER PASS	177.7	0.11	0.6

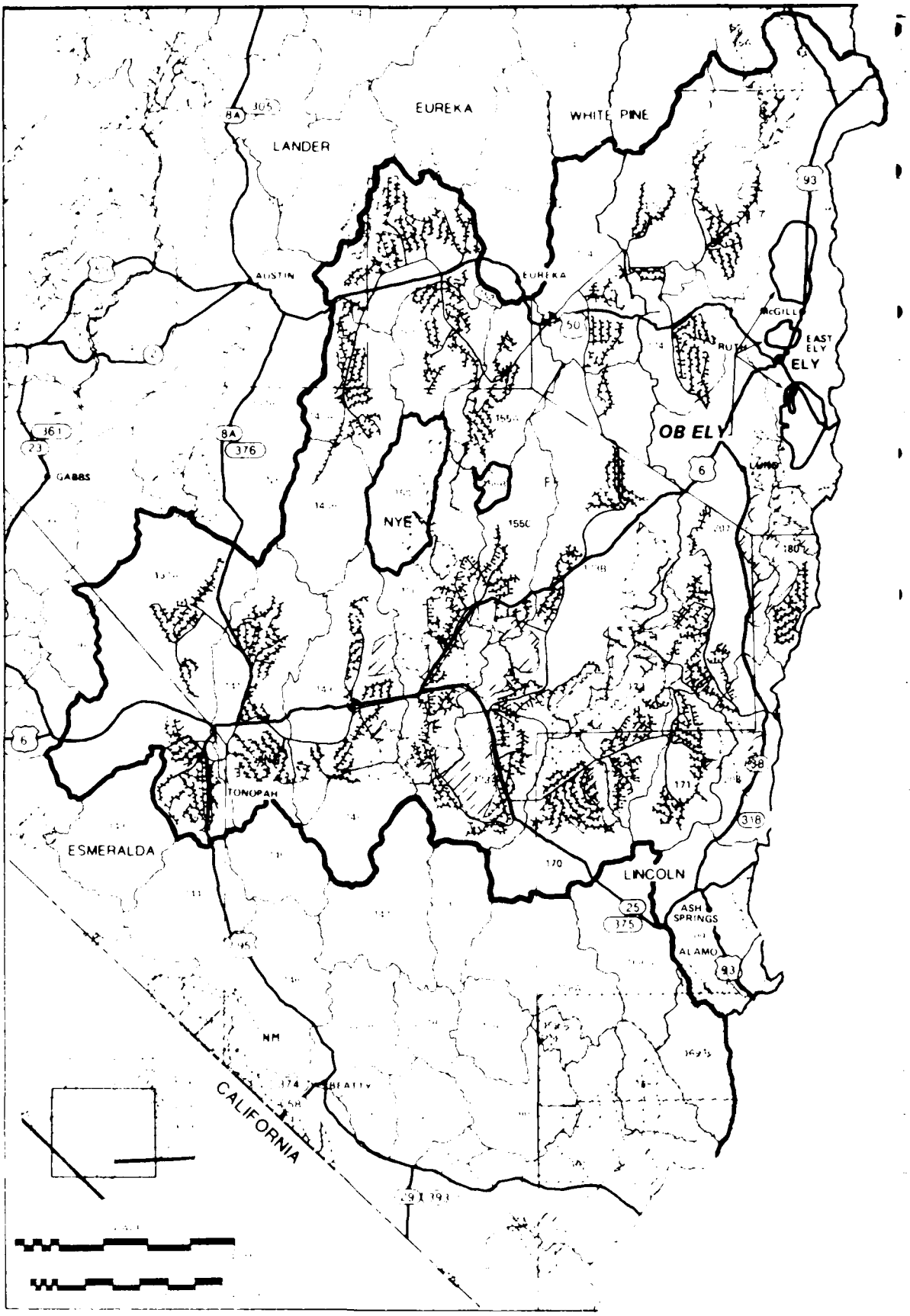
*INDEX OF PRIMACY (PERCENTAGE OF LARGEST VALUE) CALCULATED WITH PERCENT INCREASE CT0160
+INDEX OF PRIMACY CALCULATED WITH INDEX OF V-D/ACRE

Impacts on the wilderness resource can be defined by the extent to which particular wilderness attributes -- ecosystem integrity and quality of experience--are degraded. Acceptable levels are determined by the particular managing agency of a given wilderness resource in accordance with the Wilderness Act of 1964 and the Federal Land Policy and Management Act of 1976 (FLPMA). The primary sources of project-related impacts to the wilderness resource would include (1) valley floor scarification by cluster and road networks with the resultant alteration of scenic landscapes visible from montane vista points, (2) increased noise levels (ETR-10) and ambient air quality deterioration (ETR-13) during construction activities, (3) increased access to formerly remote areas, and (4) increased numbers of people.

The majority of the DDA wilderness resources are the BLM-managed wilderness study areas. Because of the paucity of ecological information on these units under current study, the salient issues as related to the project effects on general ecosystemic characteristics and quality experience are summarized in Tables 4.4.1-1 and 4.4.1-2. The significance of the effects as determined by answering the four basic questions -- competition for resources, constraints on future developments, stress on growing communities, and preservation of biological, physical, and cultural resources -- are disclosed so as not to ignore these important issues, and to emphasize the fragility of these ecosystems in addition to the poor quality of the existing data base. Attributes and unique features of wilderness resource areas predicted by the indirect effects model to receive increases of greater than 0.4 visitor-days per acre as a result of peak year (1987) M-X activities are indicated in Table 4.4.1-3.

The data in Table 4.3-1 suggest a potential for wilderness quality degradation since approximately 12 percent of the subject resources within the deployment area are within one mile of a project feature and approximately 35 percent of the resources are within 3 mi of a project feature with the consequent high probability of sight and sound intrusion as well as disturbance of wilderness fauna (e.g., pronghorn are known to flee from sounds 2.5 mi distant (Kitchen, 1974)). The audible range (approximately 6 mi) of project noises will affect roughly 80 percent of the total wilderness resource acreage in the DDA. It is assumed that M-X construction in hydrologic subunits with several resource areas will result in a greater potential for impact on the overall wilderness quality of the area than in those with only one wilderness resource area. Snake, Little Smoky-North, Hot Creek, Penoyer, Garden, Railroad-South, Railroad-North, Cave, Lake, and Coyote Spring are particularly critical subunits since all have more than 10,000 wilderness resource acres within one mi of a project feature. However, because of the large dispersed nature of the M-X project, noise and visual effects of construction activities are expected to occur over an area considerably larger than the immediate valleys disturbed during construction of facilities. These effects will diminish but not disappear during operations.

The population-related effects of the project are additive in terms of projected population trends. In the absence of M-X and other major projects, the population projection for the region indicates about a 45 percent increase by 1994 over present 1980 figures -- an increase of approximately 620,000 people (ETR-2). Including M-X, long-term growth would increase by about 34,000 people. However, calculations show that M-X will be responsible for approximately 30 percent (125,000) of the anticipated deployment region population increase during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LANDER
AUSTIN
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ELY
OB ELY
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TONOPAH
ESMERALDA
LINCOLN
ASH SPRINGS
ALAMO
CALIFORNIA
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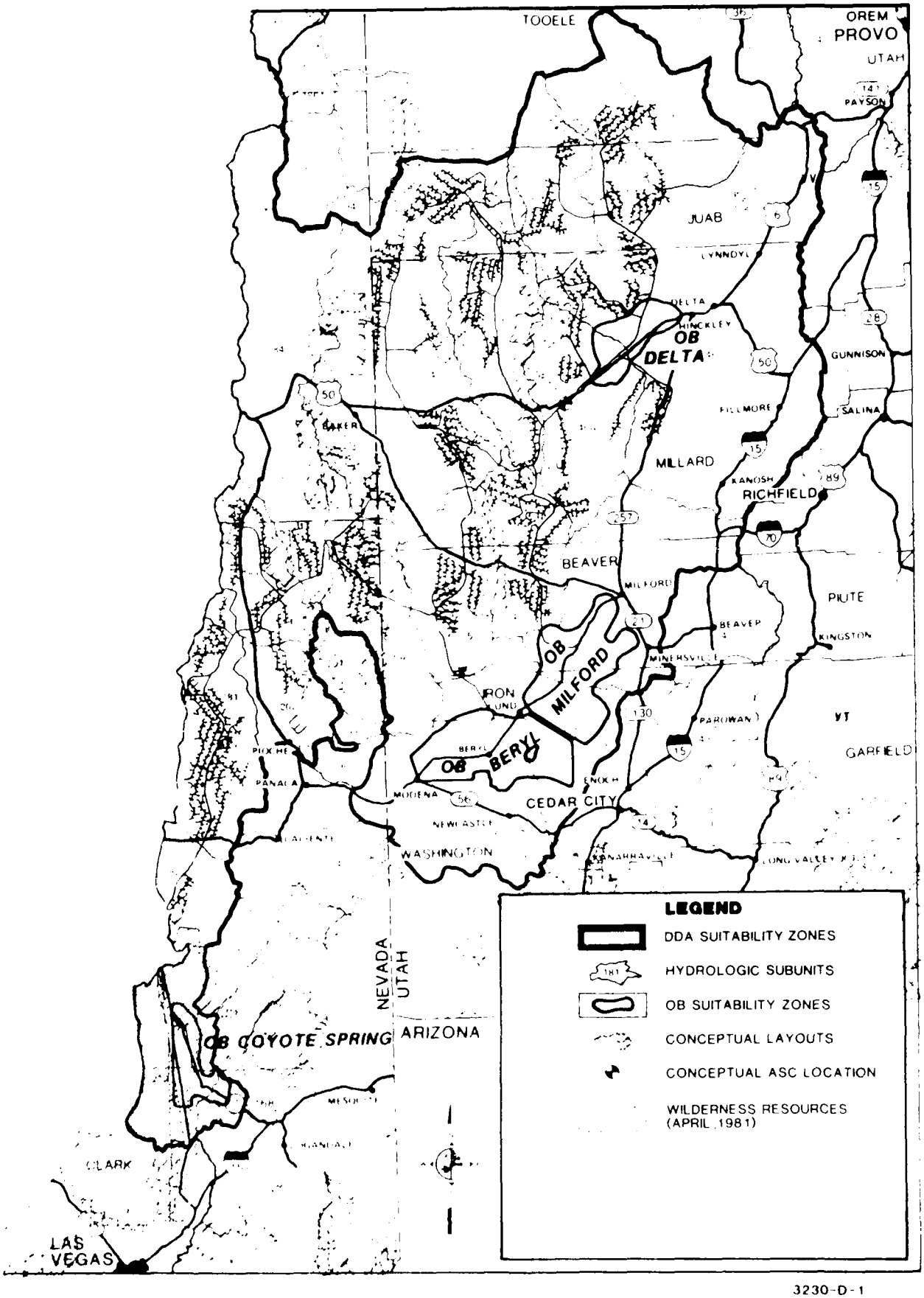

Figure 4.4.1-1. Wilderness resources and the Proposed Action conceptual layout in the Nevada/Utah study area.

Table 4.4.1-1. Summary of effects and related consequences on the attribute "wilderness ecology" for potentially significant project disturbances (Page 1 of 2).

	Compaction			Fire
	Decreased Vegetation	Erosion	Over-Protection	Selective Increase
Constraints on future development	Would decrease recharge in in watershed which is the source of aquifer recharge as well as stream and spring sources; would result in decreased opportunities for livestock watering and mining inside and outside wilderness resource areas. Berwick, 1976 Hendee et al, 1978	Would accelerate decrease in percolation; with switch-backing, loss of litter and vegetative cover, increased compaction sheet and gully erosion. McQuaid-Cook, 1978 Liddle, 1975	Loss of entire vegetative communities which are of scenic value and which are of critical importance for wildlife species (e.g., aspen and mountain bunch grass meadows are important for deer and elk). Gullion, 1973 Stoddart et al., 1955	Increase changes and loss of vegetation due to man-caused fires around heavy use areas. Hendee et al., 1978 Daubenmire, 1968, 1970 Ahlgren & Ahlgren, 1960
Competition for resources	Minor and local effects would only slightly decrease forage base for stock and wildlife primarily in riparian areas	N/A	Decrease in grazing and hunting increase in poor quality timber which cannot be extracted resulting eventually in high fuel loading and the potential for catastrophic fire with devastating effects (e.g., in areas with stands of Douglas fir and lodgepole pine--Snake, Schell Creek, and Egan ranges). Bailey, 1978 Stoddart et al., 1955	Precludes use (camping, grazing, etc.) for several years after after a fire
Stress on growing economy	Small relief of other M-X included economic stresses due to increased sales of hay, packstoves, etc. Robinson et al., 1979 Additionally, water loss may stress irrigation, agriculture, and livestock industries	N/A	Decrease in value of summer grazing leases due to decrease in grass and shrublands; loss of recreational hunting Bailey, 1978 Stoddart et al., 1955	Fire suppression activities stimulate local economies (use of facilities such as air fields, purchase of goods and services by firefighters, and employment of locals on firelines) Trollope, 1978
Preservation of biological, physical, and cultural resources	Loss of important riparian vegetation and campsites Frissell & Duncan, 1965 Wagar, 1964 Merriam & Smith, 1974 Bell & Bliss, 1973 Liddle, 1975 Schmidly et al, 1976 Settergren, 1977 Schmidly & Ditton, 1979	Loss of riparian and aquatic flora and fauna outside and inside wilderness resource areas. Hendee et al., 1978	Loss of native xeric successional communities of value to grazing, wildlife, and recreation Daubenmire, 1968 Daubenmire, 1970 Stoddard et al., 1955	Loss of riparian and aquatic flora and fauna outside and inside wilderness resource areas. Hendee et al., 1978

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Table 4.4.1-1. Summary of effects and related consequences on the attribute "wilderness ecology" for potentially significant project disturbances (Page 2 of 2).

	Fauna	Increased Use	
	Increased Winter Range Exploitation	Wood	Forage
Constraints on future development	Loss of harvestable game and furbearers during hunting and winter trapping seasons. Particular impacts may be felt by such vertical migrants as mule deer, elk, mountain sheep, and bobcat. Dasmann, 1964 Leopold, 1966 Gallizioli, 1979 Skovlin et al., 1968 Mackie, 1970	Increased exploitation of firewood results in local denudation around camps for about 20-50 years after release from impact and management control begins; also results in increased erosion, decreased water recharge, and decreased fauna. Settergren, 1977 Hendee et al., 1978	Increased pack animal may result in decreased vegetation as well as loss of palatable forage for wild grazers and livestock (cattle and sheep) Weaver and Dale, 1978 Liddle, 1975
Competition for resources	Decreased huntable and watchable wildlife in wilderness resulting in altered ecology and compressed succession time Geist, 1975 Leopold, 1966 Gallizioli, 1979 Taber & Dasmann, 1958	N/A	Competition of pack animals with livestock.
Stress on growing economy	Increased population with increased access results in increased furtrapping for valuable higher altitude furbearers such as marten and bobcat, stimulation of local economies. Smith & Jordan, 1976	Small relief of other M-X-included economic stresses due to increased sales of hay, packstoves, etc. Robinson et al., 1979 Additionally, water loss may stress irrigation, agriculture, and livestock industries.	Decreased value of summer grazing leases.
Preservation of biological, physical, and cultural resources	Loss of native fauna (marten and bobcat) and primary browsing herbivores. Hendee et al., 1978 Gallizioli, 1979	Loss of important riparian vegetation and campsites. Frissell & Duncan, 1965 Wagar, 1964 Merriam & Smith, 1974 Bell & Bliss, 1973 Liddle, 1975 Schmidly et al., 1976 Settergren, 1977 Schmidly & Ditton, 1979	Loss of important riparian vegetation and campsites. Frissell & Duncan, 1965 Wagar, 1964 Merriam & Smith, 1974 Bell & Bliss, 1973 Liddle, 1975 Schmidly et al., 1976 Settergren, 1977 Schmidly & Ditton, 1979

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Table 4.4.1-2. Summary of effects and related consequences on the attribute "wilderness quality" for potentially significant project-related disturbances (Page 1 of 2).

	Population Related Effects	
	Increased Encounters	Increased Litter and Vandalism
Constraints on future development	Decrease in quality of wilderness experience with increased densities of people would result in wilderness zoning to reduce or spread use within a finite limit and would place an absolute ceiling on the economic benefits of this type of recreation as opposed to the almost infinitely compressible high density recreation and associated profits (e.g., the floor of Yosemite Valley) foreclosure of intensive developed recreation. Heberlein, 1977 Stankey et al., 1976 Behan, 1976 Hendee et al., 1978	Would constrain use of future wilderness insofar as private land owners with access would impose restrictions on public use of access points. Increased agency costs associated with dispersion and development of less than first choice campsites would result in more dispersed use of wilderness and, therefore, decreased wilderness. Schuldt, 1980
Competition for resources	M-X-induced increased population would add to the competition for wilderness experience. The use of other USFS and BLM lands would result in increased competition for agency management, and funding for wilderness.	Management and enforcement costs associated with litter and vandalism would detract from other resource developments, e.g., intensive recreation, information/education programs, etc. DeGraffe, 1980
Stress on growing economy	The several thousand new wilderness users would stimulate local recreation supply business, and enhance tourism-based businesses, e.g., gas, motel, restaurants, gambling, etc.	A small stimulus to local economies to dispose of waste, repair and restore vandalized objects, trails, etc.
Preservation of biological, physical, and cultural resources	Influx of non-residents would change endemic cultures and economies in proportion to density of new wilderness users and how alien they are--e.g., extrapolation from Zion National Park currently indicates about 25 percent foreign users with attendant cultural adjustments. Biophysical correlates of increased public health problems, such as giardiasis, introduction of exotic flora and fauna as well as decrease in solitude aspects of wilderness Christenson et al., 1979 Anonymous, 1979 Daily & Redman, 1975 Stankey et al., 1976 Stankey, 1973 Badger, 1975 Hendee et al., 1978 Iverson, 1978 Denney, 1974 Colman & Brunner, 1972	Degradation of wilderness quality--naturalness aspect. Stankey, 1973 Lee, 1975

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Table 3.3.1-2. Summary of effects and related consequences on the attribute "wilderness quality" for potentially significant project-related disturbances (Page 2 of 2).

	Construction and Operation Effects	
	Increased Noise	Visual Pollution
Constraints on future development	Noise at levels above natural ambient (35-40 decibels) can be heard up to 10 miles from construction machinery and aircraft. Such changes in noise levels would decrease the quality of almost 80 percent of the current wilderness resources under review. Military aircraft noise in the vicinity of Hill Air Force Base, Utah, diminished the "outstanding opportunity for solitude" aspect in nearby potential wilderness under inventory that it did not qualify for continued review. Biddulph, 1980	Because of the montane nature of local wilderness resource areas, vistas and unimpeded views above timberline with a line of sight often reaching 50 miles or more. The visual imposition of M-X deployment on wilderness would be extensive since about 80 percent of these areas are resources within 6 mi of a project feature.
Competition for resources	N/A	Change in the visual nature of what is now an essentially rural, wild landscape will result in the project competing for visual or aesthetic resources. Litton, 1972 Harmon, 1980
Stress on growing economy	Local overflights of private and commercial aircraft may, if precedent holds, have to detour around, or fly above a minimum height above wilderness (e.g., Ventana and Sespe Wilderness and the California condor) resource areas.	Local overflights of private and commercial aircraft may, if precedent holds, have to detour around or fly above a minimum height above wilderness (e.g., Ventana and Sespe Wilderness and the California condor).
Preservation of biological, physical, and cultural resources	Local overflights of private and commercial aircraft may, if precedent holds, have to detour around, or fly above a minimum height above wilderness (e.g. Ventana and Sespe Wilderness and the California condor) resource areas. Increased noise will compromise wilderness quality and character particularly during construction. Hendee et al., 1978	Increased noise will compromise wilderness quality and character particularly during construction. Hendee et al., 1978 Change in the visual nature of what is now an essentially rural, wild landscape would result in the project competing for visual or aesthetic resources. Litton, 1972 Harmon, 1980

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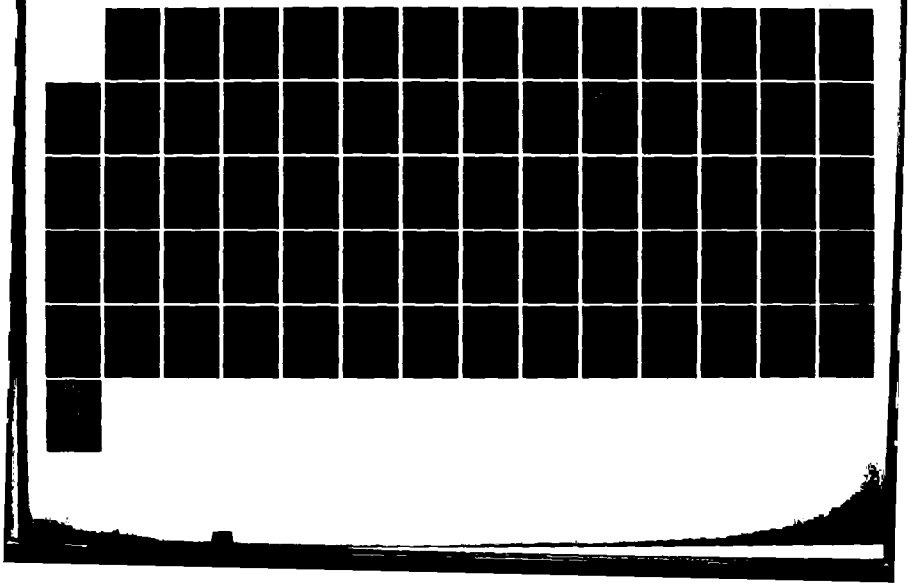

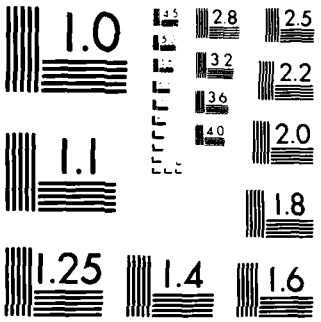

Table 4.4.1-3. Attributes of wilderness resource areas with projected crowding estimates of greater than or equal to 0.4 visitor days per acre (Page 1 of 2).

Alternative	Wilderness Resource	Water	Hiking	Hunting	Fishing	Wildlife	Opportunity for Solitude	Scenic Vistas	Accessibility	Naturalness[1]	Present Visitor Use	Fragile or Unique Attributes[2]
PA,1,2,3,4,5,6,8	Morey	***	*	***	***	***	***	***	***	***	***	A,P,BR,MR,MKH
PA,1,2,3,4,5,6,8	Roberts	*	*	***	***	***	***	***	***	*****	***	C,P,G,MR
PA,1,2,3,4,5,6,8	Grant Range	***	*	***	-	***	***	***	***	***	*	A,BR,MR
PA,1,2,3,4,5,6,8	Kawich	*****	*	*****	-	***	***	***	*****	***	*	A,PgKH,MR,MKH
PA,1,2,3,4,5,6,8	White Rock Range	***	***	***	-	***	*****	***	***	*	*	MR,MKH
PA,1,2,3,4,5,6,8	S. Pahroc s/Hiko	***	***	*****	-	*****	*****	*****	*****	*	*	A,MR
PA,1,2,3,4,5,6,8	Conger Mountain	-	***	*	-	*	***	***	***	***	*	
PA,1,2,3,4,5,6,8	Howell Peak	*	*	***	-	***	***	*****	***	***	*	MR
PA,1,2,3,4,5,6,8	Evergreen	-	*	-	-	***	***	*	*****	***	-	BR,BKH
PA,1,2,3,4,5,6,8	Lower Pahranagat	-	*	-	-	-	*****	*	*****	***	-	BR,E
PA,1,2,3,4,5,6,8	Tunnel Spring	***	*	***	*	***	***	*	***	***	***	MR
PA,1,2,3,4,5,6,8	Hontone Mine	-	*	-	-	-	***	***	***	***	*	G
PA,1,2,3,4,5,6	Martin Spring	*	***	***	-	*****	*****	*****	***	*****	*	W,MR,MKH
PA,1,2,3,4,5,6,8	Taylor Creek Canyon	-	***	-	-	-	***	-	*	***	*	
PA,1,2,3,4,5,6,8	Bear Trap Canyon	***	***	-	-	-	***	-	*	*	*	
PA,1,2,3,4,5,6,8	La Verkin Crk. Cyn.	-	***	***	-	*	***	-	*	***	-	
PA,1,2,3,4,5,6,8	Goose Creek Canyon	-	***	-	-	-	***	-	*	*	*	
PA,1,2,3,4,5,6,8	Orderville Canyon	-	***	-	-	*	***	-	*	*	**	
PA,1,2,3,4,5,6,8	N. Fork Virginia River	***	***	-	*	***	*	-	*	*	**	
PA,1,2,3,4,5,6,8	The Watchman	-	***	-	-	-	***	-	*	*	-	
PA,1,2,3,4,5,6,8	E. of Bryce	-	***	-	-	-	***	-	*	***	-	
PA,1,2,3,4,5,6,8	Red Butte	-	***	-	-	-	***	-	*	***	*	
PA,1,2,3,4,5,6,8	Deep Creek	***	***	-	-	***	***	-	*	***	*	
PA,1,2,3,4,5,6,8	Paria Canyon	*****	***	-	-	-	***	-	***	*	*****	A,G
PA,1,2,3,4,5,6,8	Escalante South	***	***		-	-	***	-	*	***	*****	G
PA,1,2,3,4,5,6,8	N. Escalante	***	***	-	*	-	***	-	***	*	*****	G
PA,1,2,3,4,5,6,8	Garrott Buttes	***	***	***	-	*	***	***	***	***	*	
PA,1,2,3,4,5,6,8	Nellis	-	***	***	-	***	*	-	***	*	*	
PA,1,2,3,4,5,6,8	Bonelli Peak	***	*	***	-	*	***	***	***	***	*	
PA,1,2,3,4,5,6,8	El Dorado	***	*	***	-	*	***	***	***	*	***	
PA,1,2,3,4,5,6,8	Ireteba Peaks	***	*	***	-	*	***	***	***	***	***	
PA,1,2,3,4,5,6,8	Gem	-	*	***	-	***	***	-	***	***	*	
PA,1,2,3,4,5,6,8	Pine Creek	***	*****	***	-	***	***	*****	***	***	***	G,A
PA,1,2,3,4,5,6,8	Zion	*****	*****	-	-	***	***	***	***	***	***	G
PA,1,2,3,4,5,6,8	Cedar Breaks	-	***	-	-	*	***	***	***	***	*	G
PA,1,2,3,4,5,6,8	Squaw & Papoose Canyon	-	*	***	-	*	***	-	*	*	*	
PA,1,2,3,4,5,6,8	Grand Gulch	-	*	***	-	*	***	-	*	*	*	
PA,1,2,3,4,5,6,8	Cross Canyon	-	*	***	-	*	***	-	*	*	*	
PA,1,2,3,4,5,6,8	Bullet Canyon	***	***	***	-	***	*	***	***	*	*****	G
PA,1,2,3,4,5,6,8	Sheiks Flat	***	***	***	-	***	*	***	***	*	*****	G

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Table 4.4.1-3. Attributes of wilderness resource areas with projected crowding estimates of greater than or equal to 0.4 visitor days per acre (Page 2 of 2).

Alternative	Wilderness Resource	Water	Hiking	Hunting	Fishing	Wildlife	Opportunity for Solitude	Scenic Vistas	Accessibility	Naturalness[1]	Present Visitor Use	Fragile or Unique Attributes[2]
PA,2,3,4,5,6	Fishlake Mountain	***	*****	***	-	***	***	***	***	***	*	A
PA,1,4,5,6	Upper Muddy	*	*	***	*	***	*	***	***	*	*	G
3,4,5,6	Cottonwood-Salmon	*****	*	*****	*****	***	***	-	***	*	***	
3,5	Little Goose Creek	*	*	***	-	***	*	-	***	*	*	
1	Horseshoe Canyon	*****	*	*	*	***	***	***	*	***	*	A
2	Devil's Canyon	***	***	***	-	***	***	***	***	*	*	
1	Capitol Reef	-	***	-	-	***	***	***	***	***	*	G
5	Birdseye	***	***	***	-	***	*	-	***	*	***	
5	Jarbidge Addition	*	***	***	***	***	***	***	*	***	***	
5	Disaster Peak	*	*	***	*	***	***	-	***	***	***	
5	Amargosa	-	*	***	-	***	***	-	***	***	*	
5	Mormon Mts.	*	*	***	-	***	***	*****	***	***	*	A
PA,2,3,4,5,6	Fremont Gorge	*	*	***	*	***	***	-	***	***	***	
2,5	Rockwell	-	***	-	-	-	*	*	***	***	***	P
4,6	Bull Mountain	-	*	-	-	-	***	-	***	*	***	
1	Factory Butte	*	***	-	*	-	***	***	***	***	*	G

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- - None
- * - Low or Poor
- *** - Moderate or Good
- ***** - High or Excellent

[1] Naturalness - A measure of the absence of cultural (i.e., noise or visual) intrusions.

[2]
- C - Caves
- P - Rare Plants
- G - Geologic
- W - Rare or Exceptional Wildlife
- B - Bighorn Sheep
- Pg - Pronghorn
- M - Mule Deer
- KH - Key Habitat
- R - Range
- E - Bald Eagle wintering area
- A - Archaeological/Historic

construction between 1982 and the peak year 1987 with the Nevada/Utah regional population reaching a total of approximately 1.84 million by 1987 (ETR-2). According to Lucas (1981) approximately 2 percent of the nation's population use wilderness with the percentage of wilderness users higher in the west. Thus an estimate of 5-10 percent of the region's 1.84 million would seem a reasonable projection of wilderness users. This means that by 1987, a potential 92,000-184,000 people would be using wilderness resources. An Air Force base survey of construction and military personnel, their associates and families at Mountain Home, Idaho indicated about 7 percent of the residents used wilderness (Ludeman, 1981). This figure does not reflect "use" frequency but rather the total number of people using the resource. The 7 percent figure is used as a reasonable estimate of projected M-X wilderness users since it is assumed that there would be demographic similarities.

Thus, a reasonable projection of potential wilderness users might be 5-10 percent of the 125,000 M-X peak year in-migrants (6,250-12,500). Trend growth projection without M-X, but including other projects, estimate an approximate 1.7 million people in the area by 1987 (ETR-2).

In contrast to the additive effects of population due to the projected spectrum of projects, M-X will act in a synergistic fashion to disperse the user population and render wilderness more accessible because of the project-related road network. In addition, the legislative constitution of wilderness as "designated" is likely to render newly classified wilderness more attractive (Hendee et al., 1978) than undesignated areas. Even in areas some distance from population centers, such as designated wilderness in Montana, 15 to 42 percent of visitors are from out of state. Similar percentages can be expected when the wilderness resources under review within the DDA are designated. These visitations may add to M-X-related and endemic growth. With the historically pristine Great Basin wildlands hosting increased levels of recreationists, there exists the potential for degradation of the ecological integrity and quality of wilderness experience that would not be entirely avoidable by increased management attention (CEQ, 1979). Furthermore, competitive demand for other recreational uses could further reduce the available supply of wilderness resources. Public comment reflects these concerns.

PUBLIC COMMENT ON THE DRAFT EIS:

> "Beyond the immediate vicinity, the M-X could result in regionwide impacts on high-quality wilderness, both in terms of reduction in air quality (2-123), and increased use pressures caused by growth. Given the nature of wilderness recreation, proportionately small increases in such demand could significantly affect the supply of this resource." (B0125-3-543).

The lack of prior use a visitor encounters on a wilderness trip influences satisfaction. According to a 1973 report, about two-thirds of the visitors to the High Uintas Primitive Area, located about 50 mi east of Salt Lake City, expressed dissatisfaction at the crowding near a lakeside camp. More than 50 percent agreed their visit was most enjoyable when they did not encounter other people. If 3 to 4 parties were encountered, the experience was considered unpleasant. According to

the survey this level of encounter is, however, common, and in 1969, this 237,000 acre area experienced over 100,000 visitor-days use (Stankey, 1973). This indicates a use level of about 0.42 visitor days/acre per year, although it should be noted that this is an average, since use density is usually uneven with highly concentrated use correlated with resources such as water and trails (Hendee et al., 1978; Lucas, 1980). Thus, a small area within any one wilderness resource receives most of the area's recreational use. Between 1969 and 1975 the area received a 32 percent increase in visitation (Hendee et al., 1978). Counties in the vicinity of the area (Cache, Davis, Morgan, Salt Lake, Utah, Wasatch, and Weber) that were potential contributors to increased use, experienced a population increase of 13 percent during the same time period (Utah Population Work Committee, 1980).

Approximately 19 percent of the Nevada/Utah USFS RARE II Wilderness under review survived as wilderness recommendations (USFS, 1979; Haaser, 1981). Assuming (1) that a similar percent of BLM recommended/designated WSAs (approximately 13 million acres as of April 1981) in the vicinity of the DDA survives wilderness screening, and (2) the peak year population estimates according to current models (ETR-2), then the average peak year (1987) visitor-days/acre BLM wilderness resource lands would be approximately 0.31 visitor-days/acre with M-X and 0.29 visitor-days/acre without M-X. These figures are 69 percent and 73 percent, respectively, of that of the High Uintas and indicate a relatively high potential for crowding at levels that degrade "opportunities of solitude" in the eyes of many users (Stankey, 1973). M-X would be responsible for about 7 percent of this increase in visitor-days/acre. This increase is compounded by the dispersal potential of the DTN, which would render the areas more accessible.

Implementation of other projects, such as the Anaconda Molybdenum Mine near Tonopah, White Pine Power Project (WPPP), Pine Grove Molybdenum project in Pine Valley, Harry Allen power project in Dry Lake Valley, Alunite Mine in Wah Wah Valley, Rocky Mountain Natural Gas Pipeline Project, and the Intermountain Power Project (IPP) near Delta, would cause additional land disturbance and population growth. Construction activities for most of these projects would be small compared to those for M-X, and the cumulative effects are expected to be small. As for the combined effects of population growth, projected population increases from construction and operation of the other projects would be small compared to those projected for M-X. IPP is the exception in which population increases during construction would approach that of M-X.

Project-related indirect effects on wilderness resources are expected to originate primarily from construction and OB population centers. Those resulting from population growth in the Coyote Spring area are expected to peak during construction when the maximum number of people (approximately 48,000) would be present in the area, and then decline with the number of people remaining (18,000) in proportion to the number of permanent residents during operations (ETR-2). Siting a base at Milford will result in a long-term population increase of about 15,400 (ETR-2). The extent to which wilderness resources in the vicinity of these OBs would experience additional use would depend upon the recreational preferences of the in-migrants. Recreational preferences and user satisfaction depend upon a number of variables.

PUBLIC COMMENT ON THE DRAFT EIS:

> "Impacts and user satisfactions depend on a great array of variables, some of them peculiar to each area (some places are easily trespassed with vehicles, whereas others are so rugged and dry that humans may never visit them during M-X construction). User behavior is a great imponderance (and one of the least accountable factors in impact calculations) for it depends on attitudes, equipment, recreational time available, and many other things. There is virtually no antecedent research on Great Basin backcountry users, much less on military and construction personnel in desert contexts." (A04753-013)

During the operations phase -- using the 7 percent figure discussed previously (Luderman, 1981) -- wilderness resources in the vicinity of Coyote Spring would receive, on the average, up to 1,300 additional visitors, while those in the vicinity of Milford would receive up to approximately 1,100 additional visitors. The impact to wilderness would vary with the density of people, this being a function of distance travelled as well as the spectrum of wilderness-related recreational opportunities of the site.

The impact of this additional use on the wilderness resource will be determined by the carrying capacity of the particular area visited. Carrying capacity is that critical number of visitors above which degradation of ecological characteristics or reduction of the quality of the wilderness experience occurs. A quantifiable measure of M-X population-related effects would be that degree to which the influx of M-X-related population causes the carrying capacity to be exceeded. At this level, no more visitors would be admitted. However, it is difficult to demonstrate specific impacts for several reasons: (1) carrying capacities have not been determined by appropriate authorities (BLM, USFS) for many of the areas since comprehensive visitor-use data are incomplete or not available (Schuldt, 1980; Shochat, 1980; Orvil, 1980; Harmon, 1980; Riddulph, 1980); (2) wilderness is a limited resource managed according to its own characteristics rather than by user demand. Demand in excess of capacity results in waiting lines, rather than additions to the system. Having to register and wait for a "wilderness experience" in itself constitutes impairment of that experience. Finally, both the Wilderness Act of 1964 and FLPMA (1976) prohibit recreational overuse.

"Productivity" of wilderness can be considered the sustainable carrying capacity for human use and enjoyment, that is the human use that can occur without degrading ecological characteristics or reducing the quality of the wilderness experience. Overuse or encroachment by audible or visual evidence of human activities (i.e., construction or crowding) will reduce the carrying capacity (productivity), for example, by rendering the periphery of an area nonwilderness, where noise of construction or trail-head crowds are experienced. Using this concept, the major reduction in productivity may occur when there is maximum construction activity and human population in proximity to wilderness resources, however, productivity would be partially restored during operations.

The effects of M-X construction would reduce short-term productivity of wilderness, particularly in areas where project features are sited within one mi of the resource. More than 60 percent of the hydrologic subunits within the DDA that

contain wilderness resources fall within this category. It is impossible to estimate the absolute level of this reduction from existing data. Reduction in long-term productivity relative to wilderness over-use is anticipated to be relatively small since appropriate management policies are expected to be implemented to preserve wilderness character. However, due to the pervasive nature of the project, reduction in long-term productivity relative to permanent alteration of scenic landscapes from vista points in montane wilderness will transcend the life of the project. This reduction in long-term wilderness productivity as compared to projections without M-X is anticipated to be relatively large due to the extensive nature of the project. Over 80 percent of deployment area wilderness resources are within 6 mi of a project feature.

The visual impact of the project features upon wilderness users in the many areas that offer sweeping vistas of large portions of the Great Basin, will be virtually permanent and constitute an irreversible and irretrievable commitment of resources. This is particularly so since many of the wilderness resources are located in montane environments above valley floors with little to obstruct the view. Project-related noise, on the other hand, will be temporary and ephemeral. Human overuse, if reduced or eliminated, is, for the most part, reversible and retrievable because of biological succession, regeneration, and colonization.

Valley roads and vehicles exist and can be seen from surrounding wilderness resources. Current use would seem to constitute an existing compromise; however, the disturbance is a matter of scale. Measurements by a line drawn on the long axis of each DDA subunit, and a line perpendicular to this axis at midpoint, indicate a baseline average of 16 intersections of roads per valley. These subunits will have an average of 11 intercepts with the project or a 9% percent increase in road intercepts. Discussions with BLM personnel (Harmon, 1980) indicate that, in or near the DDA, potential wilderness study areas were eliminated from consideration or had their boundaries withdrawn because of roads, stacks, and other visible human intrusions emanating from outside of the area. The BLM policy is currently developing toward consideration of audio-visual effects on wilderness resources as indicated by the Draft Wilderness Study Policy released December 19, 1980: "The features of the area to be considered in evaluating its outstanding opportunities for solitude are. . . presence of outside sights and sounds and whether they have such an imposing effect as to outweigh any benefits of wilderness designation" (Federal Register, 1980). Currently the threshold at which an external influence compromises wilderness quality is subjectively determined by BLM personnel. The Great Basin presently has some of the last vast stretches of relatively untouched land in the continental United States which offer opportunities for solitude. The visual impact of the 4,600 shelters, and associated road network, fencing, and support facilities would not only severely affect the visual character of the landscape but would greatly reduce those for solitude.

It is difficult to separate the project effects from the projected population growth of the Nevada/Utah region without M-X. Further, there are many values of wilderness -- companionship, solitude, self-testing, and escape -- that may be little affected by the temporary noise of construction and the permanent visual impact of the project. However, visual and noise intrusions are a matter of concern to EPA, the U.S. Forest Service, and other agencies. Standards for visual and noise factors are presently being developed for de facto wilderness (Litton and Tetlow, 1978).

As further evidence of agency and public concern for the issue of preservation of aesthetic resources (vis-a-vis wilderness) the Bureau of Land Management (Summary of SCOPING for the M-X, ETR-22% HDR, 1980) in an analysis of issues

raised during the scoping process, banned the issue of audio and visual impacts due to M-X, noting "the M-X project will create significant changes in the land-forms--changes in opportunity for dispersed and primitive forms of recreation . . . all actions occurring on BLM-managed lands which affect the appearance of the landscape are required under FLPMA and Bureau policy to be considered in terms of visual resource management objectives. These objectives require that such actions be understood and managed to be compatible with the natural character and visual quality of the landscape. Therefore, all phases of the M-X project must include considerations for scenic quality . . ." These sentiments reflect the thrust of the Wilderness Act of 1964 which defines wilderness (in part) as ". . . an area, primarily affected by the forces of nature, with the imprint of man's work substantially unnoticeable." The selection of 6 mi (from project construction and features) seems a reasonable boundary to preserve a sense of wilderness since in national forests of the western United States, middleground distances useful in revealing "man-made changes and landscape conflicts" range up to 5 mi (Litton, 1972).

Wilderness characteristics would be diminished for some wilderness resource areas. The total effects would depend upon both the relative M-X configuration and the influence of other projects. The wilderness resource areas under formal review and/or study for inclusion in the National Wilderness Preservation System (NWPS) will be evaluated on a case-by-case basis before final determinations are made by Congress on whether the areas are suitable for inclusion in the NWPS.

The Great Basin has some of the last great, relatively unspoiled scenic vistas in the continental United States. These are a priceless national and regional resource. Vast expanses of sage, Indian paintbrush and other arid land vegetation carpet the valley floors and sweep upward to meet rugged mountain ranges. It is a land of expansive vistas, gentle colors, and bold relief - where man's activities predominantly blend into the landscape. The traveller going east and west crosses mountain range after mountain range, descending from each with an unobstructed view onto the valley landscape below. Travelling north and south there are expanses of sage sweeping up on either hand to undulated ridges and stretching far ahead, largely unfenced, except for ranching and rangeland improvements. In the qualities of the landscape and its lifestyle are retained the American heritages of open spaces and frontier life styles. Even the multitude of travellers and brief visitors partake of the spiritual and aesthetic experiences, and the sense of national history, which are prevalent in the landscape. The physical and visual qualities of the M-X project would irreversible and irretrievable degrade these opportunities and diminish the value of the national resource. The highly significant impact requirements evaluation by the analysis. Considerable public concern was expressed over this.

PUBLIC COMMENT ON THE DRAFT EIS

> ". . . these always fragile resources are an important part of our vanishing natural American heritage, a heritage almost extinct in this world of ever increasing urbanization and industrialization." (MNS-3-001)

The Great Basin region is one of the few locales in the lower 48 states where such a heritage could be protected. What is certain is that the project would reduce the regional wilderness character and freedom to represent images of a genuine last frontier characterized by relict American life styles and wide open spaces. Additional consequences are summarized in Tables 4.4.1-1 and 4.4.1-2.

No.	Name					

[illegible]

[illegible]

[illegible]

AIR FORCE MITIGATION

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

A Noise Management Program will be provided by the Air Force. This program will provide for the installation of baffles and mufflers on construction equipment, planning of construction activities in consideration of noise impacts and monitoring of noise levels in sensitive areas.

The Air Force will provide education programs for workers and dependents. These programs will be designed to educate personnel on the need to preserve the aesthetic quality of wilderness resources and to the sensitivity of the resources in these areas. These programs would be conducted in the construction camps and operation bases.

OTHER MITIGATIONS UNDER CONSIDERATION

Impairment of Landscape Due to Vegetation

Revegetation and revegetation programs involving seeding and replanting would be other mitigation that could be undertaken to reduce the impairment to scenic landscapes caused by clearing and road construction. The particular impact of cutting trees and revegetation would take years to fully mitigate. However, a revegetation program using native species, especially the tallest species, would alleviate, to some extent, the visual impact.

Impairment of Wilderness Due to Noise

There are several potential mitigations that could be included to reduce the impact of impairment of the aesthetic and spiritual quality of wilderness areas due to construction noise. The measures could be to reduce the noise. Construction noise will have a temporary impact, affecting any one wilderness subunit for no longer than two to three weeks at most. Among the ways to reduce the impacts of noise can be achieved by using equipment that meets EPA noise emission guidelines (U.S. Dept. of Energy, 1979). Earthmoving noise because could be used to create noise barriers temporarily although these construction would in itself create noise (Wisconsin Pollution Control Agency, 1981). Earthmoving physicians of trucks on high vegetation are effective (Wisconsin Wisconsin Water and Power Agency, 1981). Water requirements may provide this type of mitigation.

Two other possible measures could be the scheduling of aircraft to avoid low over flights in the vicinity of wilderness areas and scheduling construction to avoid times to lessen noise impacts.

Impairment of Landscape Due to Air Quality

There are three potential mitigations that could be included to reduce the impairment of scenic landscapes visible from mountain areas passive due to changes in air quality from construction emissions. These include minimizing construction activities on windy days, scheduling construction to avoid times to lessen plant impacts, and scheduling construction activities for a time of year when soil moisture is high. Soil moisture content determination would have to be measured on a site-specific basis.

Impairment of Wilderness Quality from Increased Recreation

COYOTE SPRING VALLEY (OB) (4.4.2)

[illegible] for the Coyote Spring OB [illegible] resource areas. Figure 4.4.2-1 [illegible] these features.

[illegible] area conflicts with [illegible] WSA #NV-020-624e, Lost and [illegible] conflict with [illegible], WSA #NV-020-617, Delamar Mountains [illegible] and FW #53, Desert National [illegible]; FLPMA, 1976) these [illegible] Congressionally Designated [illegible] are legally excluded from such [illegible] available. If the proposed layout [illegible] would not impinge on the [illegible] resolve the conflict by [illegible] WSA status.

[illegible] Evergreen WSA, [illegible] unacceptable [illegible] additional loss would [illegible] associated with more [illegible]

[illegible] proposed base [illegible] Nellis Air Force Base Test and Training Range Complex (NTTR) [illegible] Nellis Air Force Base Test and Training Range Complex (NTTR) [illegible] Coyote Spring Valley. Since it must be [illegible] between the OB and the nearest cluster [illegible] additional impact on the Meadow [illegible]

[illegible] the OB would be [illegible] wilderness [illegible] these areas. Exact siting [illegible] be required for precise estimation of the [illegible] would be affected; however, existing [illegible] of the Evergreen WSA and Mormon Mesa #1 and [illegible] of the Delamar Mountains [illegible] WSA, located near the Arrow Canyon [illegible] the proposed conceptual- [illegible] effects on the adjacent WSAs [illegible] unavoidable and irretrievable [illegible] mitigation measures. The [illegible] of the present plan for the [illegible]

[illegible] Package

Figure 4.4.2-1. Wilderness resources in the vicinity of the Coyote Spring OB.

An influx of an estimated 18,000 permanent residents to the Coyote Spring area is anticipated with project implementation (ETR-2). The effects of this large human population growth would be expected to increase use of the wilderness resources in the area--and will vary with the socioeconomic and demographic characteristics of the in-migrants. A general summary of potential consequences relative to the four issue areas is provided in Tables 4.4.1-1 and 4.4.1-2.

Hydrologic subunits were ranked as low, moderate, or high potential impact based on the mean indirect effects index for all wilderness resources in a given subunit. Table 4.4.1-4 summarizes wilderness resource abundance and level of population-related effects on a hydrologic subunit basis with Coyote Spring as Operating Base A for the Proposed Action. According to the indirect effects analysis, regions outside the DDA anticipated to receive a greater than 15 percent increase in visitor-days as a result of M-X include the BLM-managed Cedar Ridge, Red Spring, Little Humboldt River, Gabbs Valley, Basalt, Hontone Mine, Silver Peak Range, Tunnel Spring, Grapevine Spring, Pigeon Spring, Bourie Clair Flat, Queer Mountain, as well as the USFS-managed Excelsior and White Mountains (Table 4.3-2).

MILFORD OB (4.4.3)

There are no wilderness resource areas present within the immediate vicinity of the Milford OB site. The closest wilderness resource is the BLM-managed Wah Wah Mountains WSA approximately 30 mi north-northwest of the base.

A projected long-term population increase of approximately 15,400 is anticipated for the Milford area as a result of base siting (ETR-2). As discussed in the previous section, effects of such growth--increased use of wilderness resources and associated impacts--will demand increased management attention. Table 4.4.1-4 summarizes wilderness resource abundance and level of population-related impacts by hydrologic subunit with Milford as Base B for the Proposed Action. Additional wilderness resources outside the DDA anticipated to receive a greater than 15 percent increase in visitor-day use as a result of M-X are the same as those already discussed for Coyote Spring.

4.5 ALTERNATIVE 1

The DDA, first OB, and associated impact would be the same as for the Proposed Action. The second OB would be located at Beryl, Utah.

There are no wilderness resources in the immediate vicinity of the proposed second base. The closest areas are the RARE II recommended Pine Valley Mountain region and the BLM-managed White Rock and Central Wah Wah Mountains. All are located approximately 30 air-miles south-southeast of the base site.

Impacts of an OB in this area would stem from the indirect effects of the movements and recreational activities of an estimated 14,400 additional permanent residents in the Beryl region (ETR-2). Although recreational use preferences would be a function of the socioeconomic and demographic characteristics of the in-migrants, key hydrologic subunits targeted for increased wilderness visitation, including level of population-related effects as identified by the indirect effects index, are the same as those listed for the Proposed Action (Table 4.4.1-4).

Wilderness resources outside the DDA anticipated to receive at least a 15 percent increase in visitor-day use because of project siting are also the same as those tabulated under the Proposed Action.

4.6 ALTERNATIVE 2

The DDA, first OB, and associated impacts would be the same as for the Proposed Action. The second OB would be located near Delta. There are no wilderness resources intersecting the OB suitability zone. The nearest wilderness resource is the BLM-managed Swasey Mountains approximately 12 mi northwest of the base location. Additional nearby areas include the designated WSAs Notch and Howell Peaks located approximately 16 and 18 mi, respectively, to the west of the proposed site.

An influx of an estimated 14,500 permanent residents to the Delta area is expected as a result of using Delta as a second base (ETR-2). According to the indirect effects analysis hydrologic subunits anticipated to receive increased wilderness resource use (including the level of population-related effects) that would result from a second base siting in the vicinity of Delta differ from the Proposed Action and Alternative 1 only with respect to the Muddy River Springs subunit (Table 4.4.1-4). Wilderness resources outside the DDA anticipated to receive a greater than 15 percent increase in visitor day use because of project siting are the same as for the Proposed Action and Alternative 1.

4.7 ALTERNATIVE 3

The DDA and associated impacts would be the same as for the Proposed Action. Using Beryl as the primary base location for Alternative 3 would result in an increase of 20,000 long-term residents in the area--approximately 27 percent more than Alternative 1 with Beryl as a second base (ETR-2). Although these figures differ, no qualitative change in the potential population-related effects of an OB location at Beryl are anticipated.

The second OB would be located near Ely. There are no wilderness resources within the proposed Ely OB suitability zone. The nearest areas include Martin Spring (a BLM-managed inventory unit under appeal to the Interior Board of Land Appeals) located approximately 22 mi southwest of the proposed site; and, the designated WSAs, South Egan Range and Mt. Grafton located approximately 30 and 35 air-miles, south-southwest and south, respectively. Additional nearby resources are the USFS Further Planning Unit, Mt. Moriah, and the South Egan Range WSA. Both are within approximately 30 air-miles of the Ely suitability zone. Impacts to wilderness by locating an OB in the vicinity of Ely would stem from the recreational activities of an estimated 15,400 additional permanent residents in the region (ETR-2). Using the indirect effects index for impact analysis, it is possible to identify candidate hydrologic subunits for increased backcountry use. Table 4.7-1 summarizes wilderness abundance and level of population-related effects. Wilderness resources outside the DDA anticipated to receive greater than 15 percent increase in visitor-day use because of project siting include the BLM-managed Cedar Ridge, Red Spring, Little Humboldt River, Gabbs Valley, Silver Peak Range, Tunnel Spring, Pigeon Spring, Queer Mountain, Death Ridge, Cougar Canyon, and the USFS-managed White Mountains.

Table 4.7-1. Potential impact[1] to wilderness resources in the Nevada/Utah DDA and associated OB hydrologic subunits for Alternatives 3 and 5.

No.	Hydrologic Subunit Name	Approximate Wilderness Resource Acreage Within Subunit	Visual Effects[a]	Noise Effects[b]	Indirect Effects[c]	Estimated Overall Impact[3]
	DDA					
4	Snake, Nev./Utah	252,776	*****	*****	*****	*****
5	Pine, Utah	37,478	*****	***	***	***
6	White, Utah	124,636	*****	*****	*****	*****
7	Fish Springs, Utah	50,313	*****	*****	*****	*****
8	Dugway, Utah	[illegible].691	***	***	***	***
	Alternative 5				*****	
9	Government Creek, Utah	0	*	-	-	*
46	Sevier Desert, Utah	20,536	***	***	*****	*****
46A	Sevier Desert-Dry Lake, Utah	48,574	*****	*****	*****	*****
50	Milford, Utah[2]	0	*	-	-	*
52	Lund District, Utah[2]	0	*	-	-	*
53	Beryl-Enterprise, Utah[2]	835	***	-	***	***
54	Wah Wah, Utah	43,208	*****	*****	*****	*****
137A	Big Smoky-Tonopah Flat, Nev.	3,775	***	-	*	***
139	Kobeh, Nev.	29,947	*****	***	*****	*****
140A	Monitor-North, Nev.	0	*	-	-	*
140B	Monitor-South, Nev.	0	*	-	-	*
141	Ralston, Nev.	0	*	-	-	*
142	Alkali Spring, Nev.	0	*	-	-	*
148	Cactus Flat, Nev.	6,785	*	***	*****	*****
149	Stone Cabin, Nev.	38,662	*****	*****	*****	*****
151	Antelope, Nev.	0	*	-	-	*
154	Newark, Nev.	0	*	-	-	*
155A	Little Smoky-North, Nev.	27,516	*****	*****	*****	*****
155C	Little Smoky-South, Nev.	15,918	*****	*****	*****	*****
156	Hot Creek, Nev.	208,069	*****	*****	*****	*****
170	Penoyer, Nev.	44,303	*****	*****	*****	*****
171	Coal, Nev.	17,568	***	***	***	***
172	Garden, Nev.	36,941	*****	***	***	*****
173A	Railroad-South, Nev.	89,527	***	***	*****	*****
173B	Railroad-North, Nev.	266,651	*****	*****	*****	*****
174	Jakes, Nev.	0	*	-	-	*
175	Long, Nev.	0	*	-	-	*
178B	Butte-South, Nev.	16,748	***	*	*****	*****
179	Steptoe, Nev.	67,582	*****	*****	*****	*****
180	Cave, Nev.	74,850	*****	*****	*****	*****
181	Dry Lake, Nev.	0	*	-	-	*
182	Delamar, Nev.	22,927	*****	*****	***	*****
183	Lake, Nev.	60,193	*****	*****	*****	*****
184	Spring, Nev.	77,733	*****	*****	***	*****
196	Hamlin, Nev./Utah	56,351	*****	***	*****	*****
202	Patterson, Nev.	39,732	*	***	***	***
205	Meadow Valley Wash, Nev.[2]	325,062	*****	***	***	*****
207	White River, Nev.	144,953	*****	*****	***	*****
208	Pahroc, Nev.	43,432	*	***	***	***
209	Pahranagat, Nev.	89,708	*****	*****	***	*****
210	Coyote Spring, Nev.[2]	339,708	*****	*****	***	*****
219	Muddy River Springs, Nev.[2]	17,360	***	***	*	***

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[1] - = None
a) Value not used.
b) Wilderness resources lie beyond 6 mi from nearest project feature.
c) No wilderness resources.

* = Low
a) Due to the pervasive nature of the project on "de facto" wilderness areas, a low visual impact value was accorded to subunits which presently contain no wilderness resource areas.
b) Only one wilderness resource lies between 3 and 6 mi from nearest project feature.
c) Average value of indirect effects indices, including user increase, access, and crowding is less than three.

*** = Moderate
a) One to ten percent additional road intercepts due to M-X are visible from more than one wilderness resource.
b) Two or three wilderness resources each lie between 3 to 6 mi from a project feature; or only one wilderness resource is less than 3 mi from a project feature.
c) Average value of indirect effects indices, is less than four.

***** = High
a) More than ten percent additional road intercepts due to M-X are visible from more than one wilderness resource.
b) If more than one wilderness resource is less than 3 mi from any project feature.
c) Average value of indirect effects indices is four or greater.

[2] Subunits containing OB sites.

[3] Impact index determined as the maximum of the effect ratings.

4.8 ALTERNATIVE 4

The DDA and associated impacts would be the same as for the Proposed Action. Impacts for the first OB at Beryl are the same as for Alternative 3.

Impact for the proposed OB location at Coyote Spring are discussed under the Proposed Action. Although the siting of Coyote Spring as a second OB would reduce the influx of permanent residents by about 24 percent, there would be no substantial change in the indirect population-related effects of an OB location in this region. Table 4.8-1 summarizes wilderness abundance and level of population-related effects. Wilderness resources outside the DDA anticipated to receive greater than 15 percent increase in visitor-day use are the same as those listed for the Proposed Action.

4.9 ALTERNATIVE 5

Impacts for the proposed OB location at Milford are discussed under the Proposed Action. Using Milford as the primary base would result in an estimated 28 percent increase in permanent residents over that projected for Milford as a second base, but no substantial qualitative changes in the anticipated recreational impacts on wilderness resources would be expected. Hydrologic subunits with the potential for impact as a result of first OB are listed in Table 4.7-1, as are the level of population-related effects. Impacts for the proposed Ely OB are the same as for Alternative 3.

4.10 ALTERNATIVE 6

The DDA and associated impacts would be the same as for the Proposed Action. Impacts for a first OB at Milford and a second OB at Covote Spring are the same as those for Alternatives 5 and 4, respectively. Table 4.10-1 summarizes wilderness abundance and level of population-related effects on a hydrologic subunit basis for Alternative 6.

4.11 ALTERNATIVE 7

Wilderness resources within the Texas/New Mexico study region include the Sabinosa Wilderness Study Area (WSA) and the Congressionally Designated Salt Creek Wilderness within the Bitter Lake National Wildlife Refuge. It is not anticipated that M-X construction activities would result in significant impact to the wilderness quality of either area. The Sabinosa WSA is located approximately 40 mi from the nearest project feature and potential project-related effects on the wilderness quality of the Salt Creek are small compared with those due to its proximity to the City of Roswell (Figure 4.11-1). Table 4.11-1 summarizes potential impacts to wilderness resources for Alternative 7.

With the exception of hunting, siting an OB at Clovis would not be anticipated to result in substantial increases in recreational activities within the Salt Creek Wilderness. Present management strategies are to promote educational and scientific use of the Bitter Lake NWR and to discourage picnicking (Marlatt,1980). However, the steep rock-walled canyons and densely vegetated landscape characterizing the Sabinosa WSA could serve as a magnet for wilderness recreationists from as far away as Clovis (approximately 100 mi). No direct or substantial indirect impacts to the wilderness resource are anticipated as a result of the Dalhart OB.

Table 4.3-1. Potential impact[1] to wilderness resources in the Nevada-Utah DDA and associated OB hydrologic subunits for Alternative 4.

No.	Hydrologic Subunit Name	Approximate Wilderness Resource Acreage Within Subunit	Visual Effects[4]	Noise Effects[5]	Indirect Effects	Estimated Overall Impact[3]
	DDA					
4	Snake, Nev.-Utah	292,996	•••••	•••••	•••••	•••••
5	Pine, Utah	37,478	•••••	•••	•••••	•••••
6	White, Utah	126,636	•••••	•••••	•••••	•••••
7	Fish Springs, Utah	50,313	•••••	•••••	•••••	•••••
8	Dugway, Utah	10,691	•••	•••	•••	•••
9	Government Creek, Utah	0	•	-	-	•
46	Sevier Desert, Utah	20,536	•••	•••	•••••	•••••
46A	Sevier Desert-Dry Lake, Utah	68,576	•••••	•••••	•••••	•••••
50	Milford, Utah[2]	0	•	-	-	•
52	Lund District, Utah[2]	0	•	-	-	•
53	Beryl-Enterprise, Utah[2]	835	•••	-	•••	•••
54	Wah Wah, Utah	63,208	•••••	•••••	•••••	•••••
137A	Big Smoky-Tonopah Flat, Nev.	3,775	•••	-	•••	•••
139	Kobeh, Nev.	29,967	•••••	•••	•••••	•••••
140A	Monitor-North, Nev.	0	•	-	-	•
140B	Monitor-South, Nev.	0	•	-	-	•
141	Ralston, Nev.	0	•	-	-	•
142	Alkali Spring, Nev.	0	•	-	-	•
148	Cactus Flat, Nev.	6,785	•	•••	•••••	•••••
149	Stone Cabin, Nev.	38,662	•••••	•••••	•••••	•••••
151	Antelope, Nev.	0	•	-	-	•
154	Newark, Nev.	0	•	-	-	•
155A	Little Smoky-North, Nev.	27,516	•••••	•••••	•••••	•••••
155C	Little Smoky-South, Nev.	15,918	•••••	•••••	•••••	•••••
156	Hot Creek, Nev.	208,069	•••••	•••••	•••••	•••••
170	Penover, Nev.	66,303	•••••	•••••	•••••	•••••
171	Coal, Nev.	17,568	•••	•••	•••••	•••••
172	Garden, Nev.	86,961	•••••	•••••	•••••	•••••
173A	Railroad-South, Nev.	99,527	•••	•••	•••••	•••••
173B	Railroad-North, Nev.	266,651	•••••	•••••	•••••	•••••
174	Jakes, Nev.	0	•	-	-	•
175	Long, Nev.	0	•	-	-	•
178B	Butte-South, Nev.	16,788	•••	•	•••	•••
179	Steptoe, Nev.	67,582	•••••	•••••	•••	•••••
180	Cave, Nev.	76,850	•••••	•••••	•••	•••••
181	Dry Lake, Nev.	0	•	-	-	•
182	Delamar, Nev.	22,927	•••••	•••••	•••	•••••
183	Lake, Nev.	60,193	•••••	•••••	•••••	•••••
184	Spring, Nev.	77,733	•••••	•••••	•••	•••••
196	Hamlin, Nev./Utah	56,351	•••••	•••	•••••	•••••
202	Patterson, Nev.	39,732	•	•••	•••	•••
205	Meadow Valley Wash, Nev.[2]	325,062	•••••	•••	•••	•••••
207	White River, Nev.	146,953	•••••	•••••	•••	•••••
208	Pahroc, Nev.	63,632	•	•••	•••••	•••••
209	Pahranagat, Nev.	89,708	•••••	•••••	•••	•••••
210	Coyote Spring, Nev.[2]	339,708	•••••	•••••	•••	•••••
219	Muddy River Springs, Nev.[2]	17,360	•••	•••	•	•••

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[1] - : None
a) Value not used.
b) Wilderness resources lie beyond 6 mi from nearest project feature.
c) No wilderness resources.

• : Low
a) Due to the pervasive nature of the project on "de facto" wilderness areas, a low visual impact value was accorded to subunits which presently contain no wilderness resource areas.
b) Only one wilderness resource lies between 3 and 6 mi from nearest project feature.
c) Average value of indirect effects indices, including user increase, access, and crowding is less than three.

••• : Moderate
a) One to ten percent additional road intercepts due to M-X are visible from more than one wilderness resource.
b) Two or three wilderness resources each lie between 3 to 6 mi from a project feature; or only one wilderness resource is less than 3 mi from a project feature.
c) Average value of indirect effects is less than four.

••••• : High
a) More than ten percent additional road intercepts due to M-X are visible from more than one wilderness resource.
b) If more than one wilderness resource is less than 3 mi from any project feature.
c) Average value of indirect effects indices is four or greater.

[2] Subunits containing OB sites.

[3] Impact index determined as the maximum of the effect ratings.

Table [illegible] Potential [illegible] impacts resulting from the Nevada Test Site and associated [illegible] withdrawal actions for [illegible] alternatives

[illegible]	[illegible] Subunit Name	Acquisition Status (Federal land [illegible] Acreage in Subunit)	Visual Effects[1]	Noise Effects[2]	Indirect Effects	Estimated Overall Impact[3]
[illegible]						
[illegible]	[illegible], Nev. [illegible]	[illegible]	*****	*****	*****	*****
[illegible]	[illegible], Calif.	[illegible]	*****	***	***	*****
[illegible]	[illegible], Calif.	[illegible]	*****	*****	*****	*****
[illegible]	[illegible] Flat [illegible], Calif.	[illegible]	*****	*****	*****	*****
[illegible]	[illegible], Calif.	[illegible]	***	***	***	***
[illegible]	[illegible] Valley [illegible], Calif.		*			*
[illegible]	[illegible] Mountain, Calif.	[illegible]	***	***	*****	*****
[illegible]	[illegible] Mountain/Dry Lake, Calif.	[illegible]	*****	*****	*****	*****
[illegible]	[illegible], Calif.[4]		*			*
[illegible]	[illegible] Flat, Calif.[4]		*			*
[illegible]	[illegible] Range Wash, Calif.[4]	[illegible]	***		***	***
[illegible]	[illegible] Wash, Calif.	[illegible]	*****	*****	*****	*****
[illegible]	[illegible] [illegible] Flat, Nev.	[illegible]	***		***	***
[illegible]	[illegible], Nev.	[illegible]	*****	***	*****	*****
[illegible]	[illegible], Nev.		*			*
[illegible]	[illegible], Nev.		*			*
[illegible]	[illegible], Nev.		*			*
[illegible]	[illegible], Nev.		*			*
[illegible]	[illegible] Flat, Nev.	[illegible]	*	***	*****	*****
[illegible]	[illegible] [illegible], Nev.	[illegible]	*****	*****	*****	*****
[illegible]	[illegible], Nev.		*			*
[illegible]	[illegible], Nev.		*			*
[illegible]	[illegible] [illegible]/South, Nev.	[illegible]	*****	*****	*****	*****
[illegible]	[illegible] [illegible]/South, Nev.	[illegible]	*****	*****	*****	*****
[illegible]	[illegible] Peaks, Nev.	[illegible]	*****	*****	*****	*****
[illegible]	[illegible], Nev.	[illegible]	*****	*****	*****	*****
[illegible]	[illegible], Nev.	[illegible]	***	***	*****	*****
[illegible]	[illegible], Nev.	[illegible]	*****	***	*****	*****
[illegible]	[illegible]/South, Nev.	[illegible]	***	***	*****	*****
[illegible]	[illegible]/South, Nev.	[illegible]	*****	*****	*****	*****
[illegible]	[illegible], Nev.		*			*
[illegible]	[illegible], Nev.		*			*
[illegible]	[illegible], Nev.	[illegible]	***	*	***	***
[illegible]	[illegible], Nev.	[illegible]	*****	*****	***	*****
[illegible]	[illegible], Nev.	[illegible]	*****	*****	***	*****
[illegible]	[illegible], Nev.		*			*
[illegible]	[illegible], Nev.	[illegible]	*****	***	*****	*****
[illegible]	[illegible], Nev.	[illegible]	*****	*****	*****	*****
[illegible]	[illegible], Nev.	[illegible]	*****	*****	***	*****
[illegible]	[illegible], Nev.[4]	[illegible]	*****	***	*****	*****
[illegible]	[illegible], Nev.	[illegible]	*	***	***	***
[illegible]	[illegible] Valley [illegible], Nev.[4]	[illegible]	*****	***	***	*****
[illegible]	[illegible] [illegible], Nev.	[illegible]	*****	*****	***	*****
[illegible]	[illegible], Nev.	[illegible]	*****	***	*****	*****
[illegible]	[illegible], Nev.	[illegible]	*****	*****	***	*****
[illegible]	[illegible] Spring, Nev.[4]	[illegible]	*****	*****	***	*****
[illegible]	[illegible] [illegible] Springs, Nev.[4]	[illegible]	***	***		***

***** [illegible]

- None — a) Value not used.
  b) No wilderness resources lie beyond 4 mi from nearest project feature.
  c) No wilderness resources.
- * — a) Due to the perceptive value of the project on the "worst" wilderness areas, a low visual impact value was accorded to subunits which presently contain no wilderness resource areas.
  b) Only one wilderness resource lies between 3 and 4 mi from nearest project feature.
  c) Value not used.
- *** — Moderate — a) One to ten percent additional road intercepts due to NTS are visible from more than one wilderness resource.
  b) Two or three wilderness resources each lie between 3 to 4 mi from a project feature; or only one wilderness resource is less than 3 mi from a project feature.
  c) Average value of indirect effects indices, including user increase, and rounding is less than four.
- ***** — High — a) More than ten percent additional road intercepts due to NTS are visible from more than one wilderness resource.
  b) If more than one wilderness resource is less than 3 mi from any project feature.
  c) Average value of indirect effects indices is four or greater.

[2] Subunits containing NTS areas.

[3] Impact index determined as the maximum of the effect ratings.

Table [illegible]. [illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]					
[illegible]					
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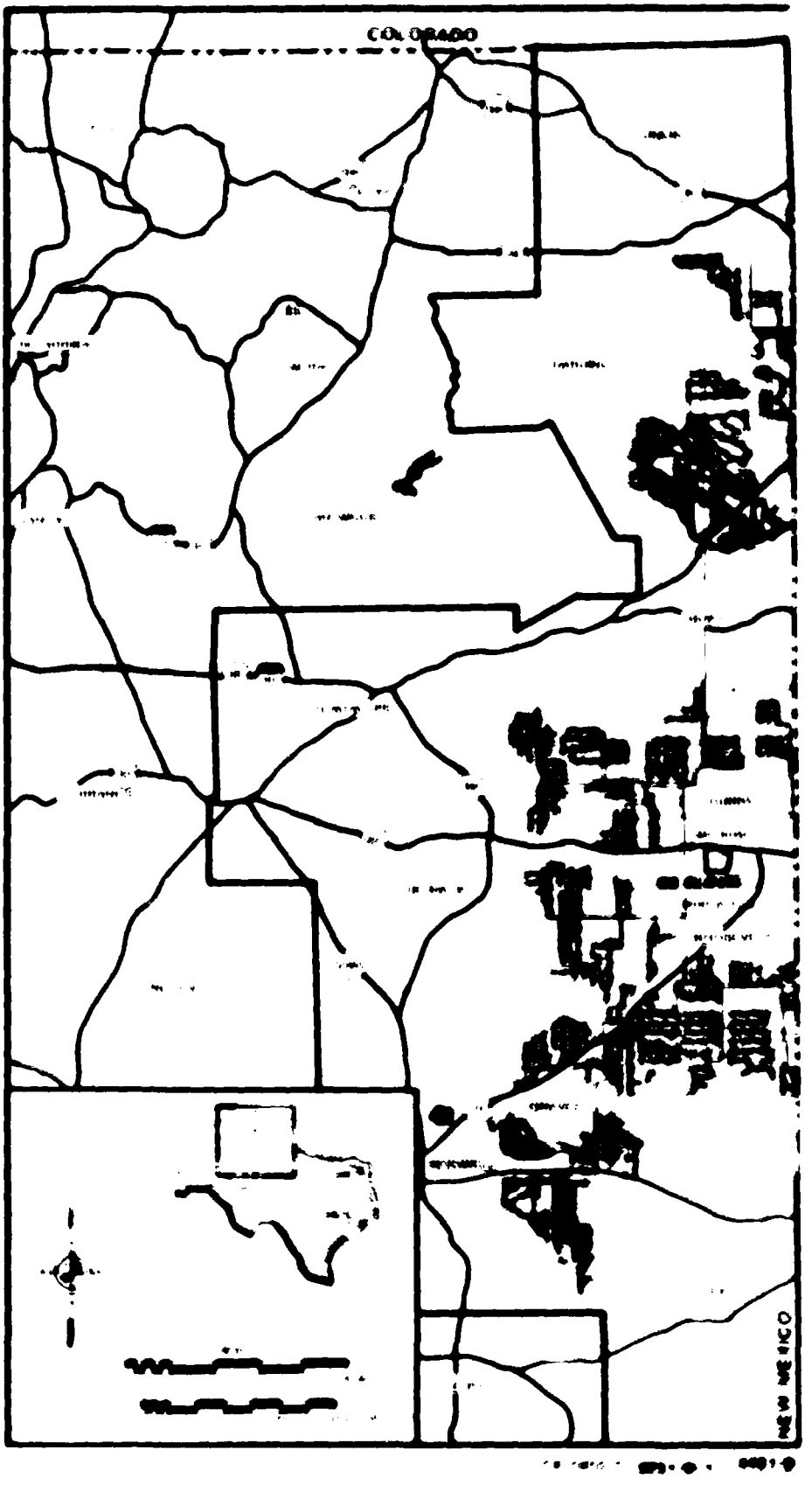
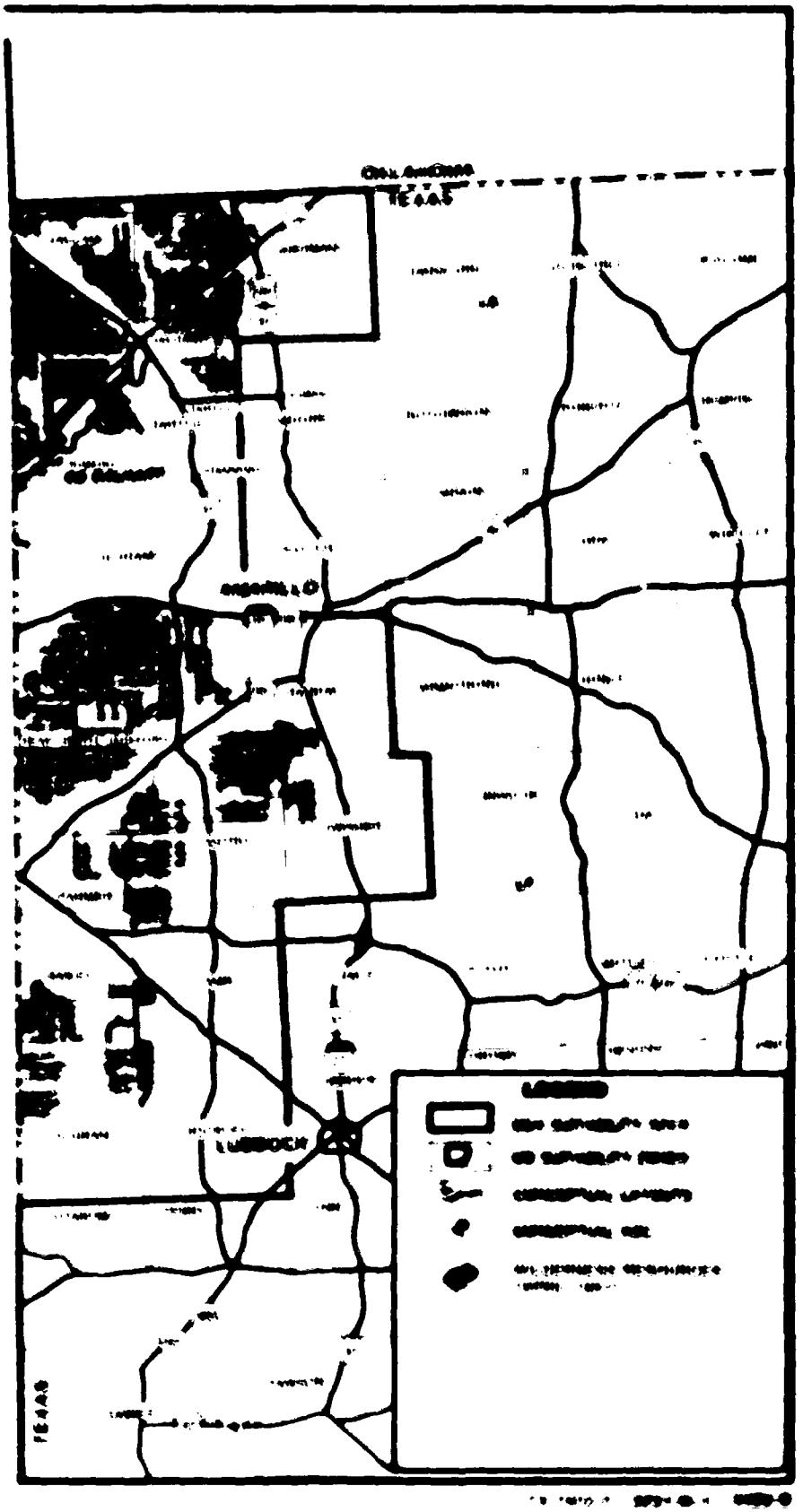
[illegible]

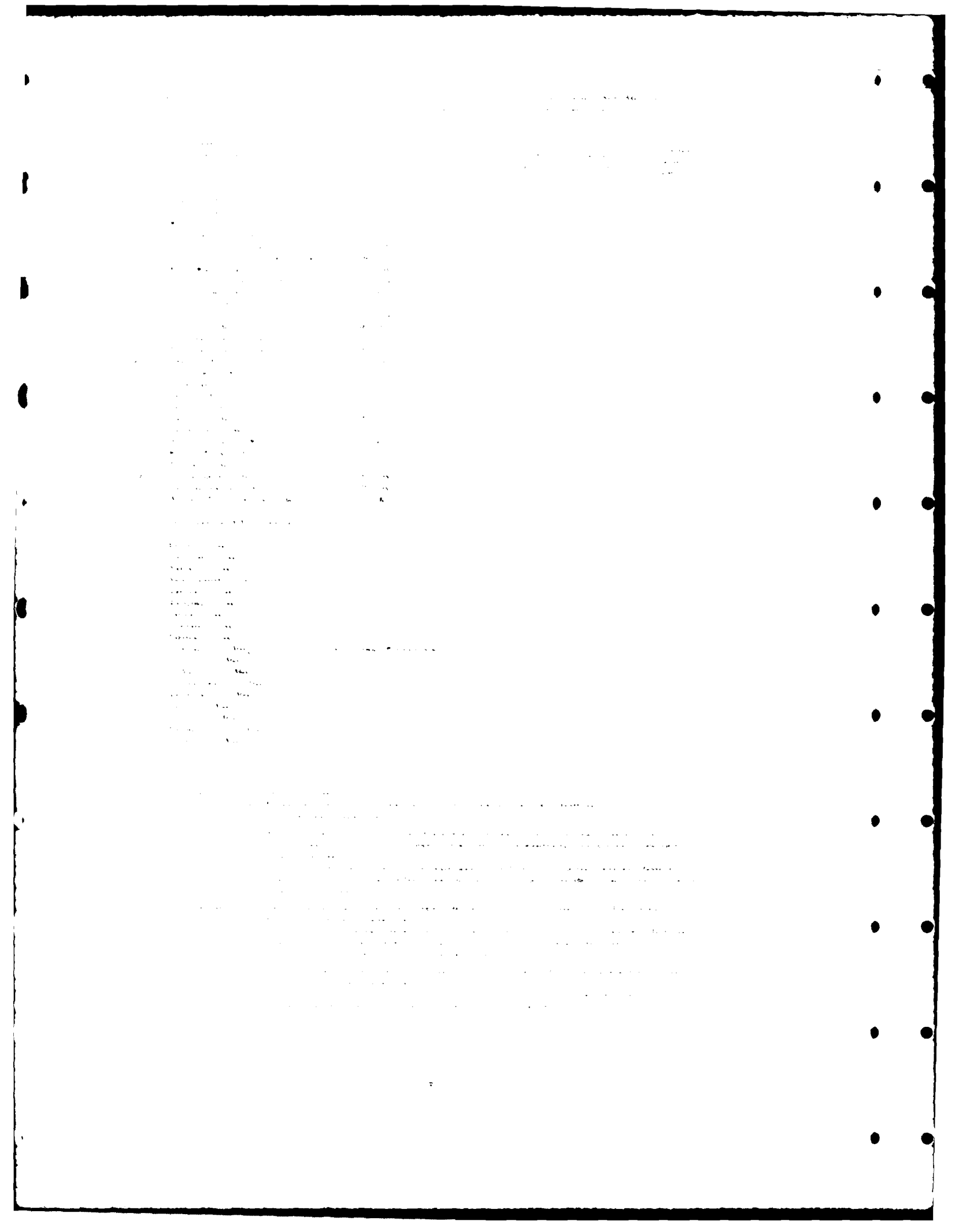
	[illegible]	a. [illegible]
		b. [illegible]
		c. [illegible]
•	[illegible]	a. [illegible]
		b. [illegible]
•••	[illegible]	a. [illegible]
		b. [illegible]
		c. [illegible]
•••••	[illegible]	a. [illegible]
		b. [illegible]
		c. [illegible]

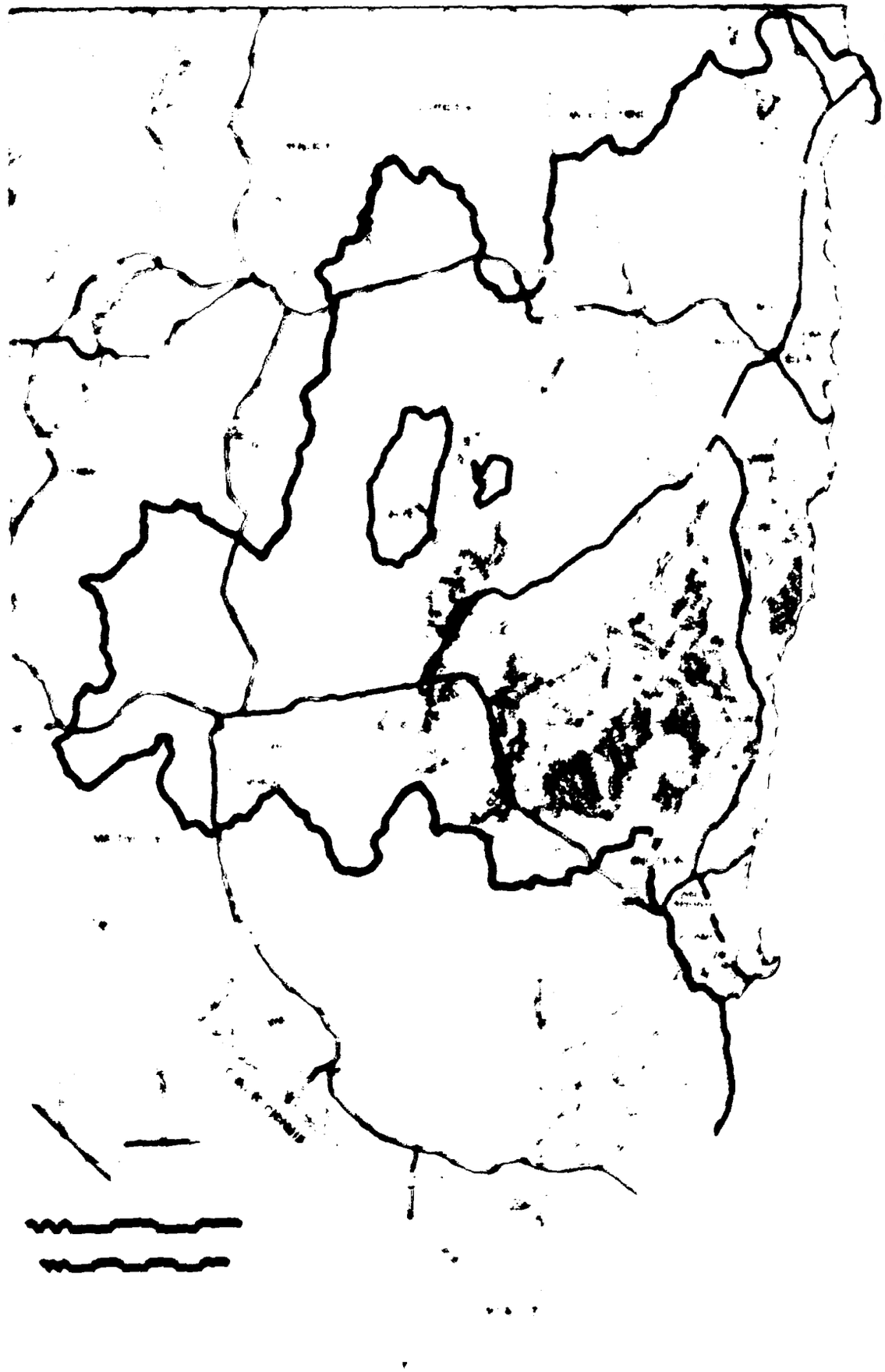
[illegible]

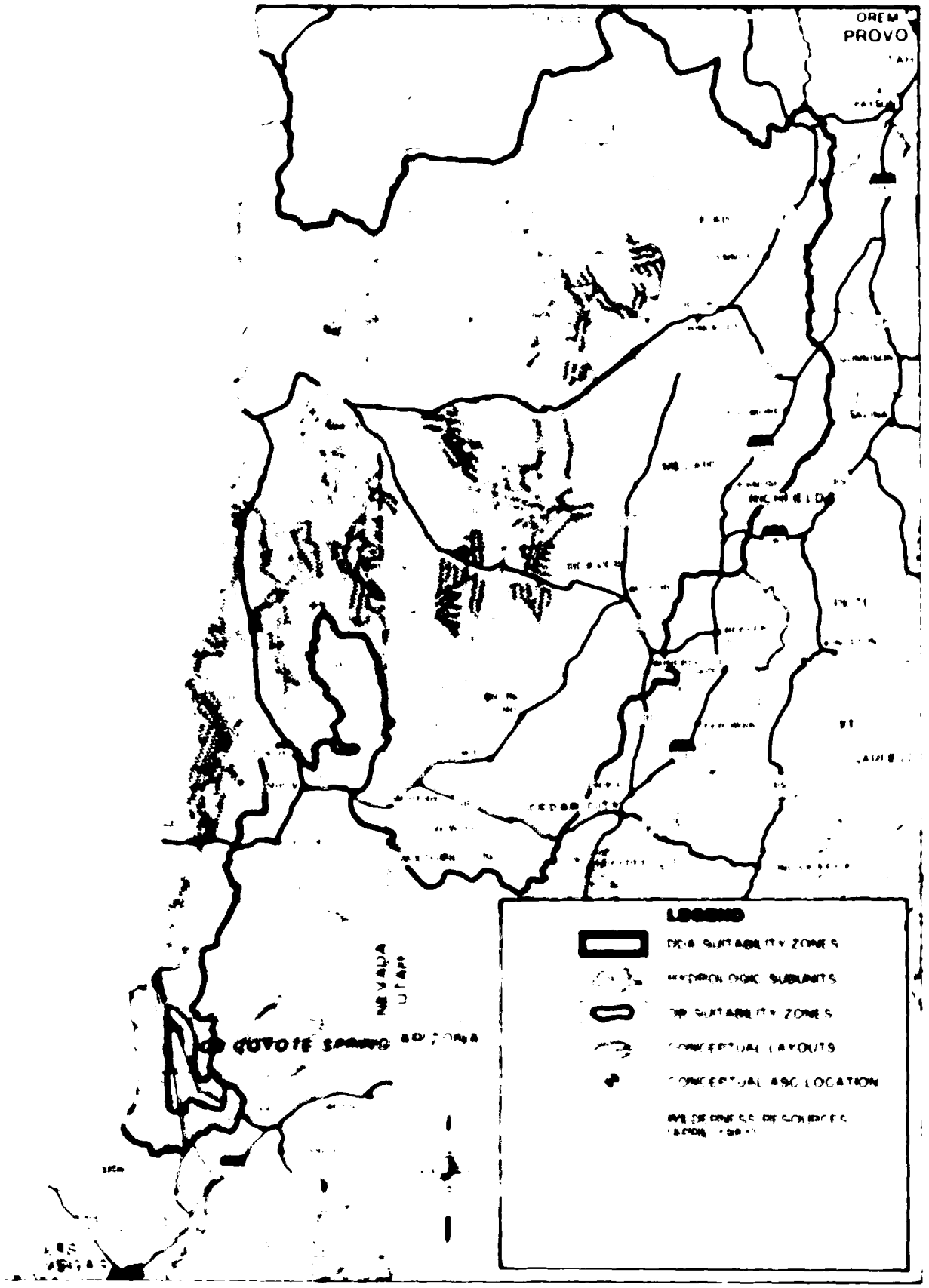

COLORADO
NEW MEXICO

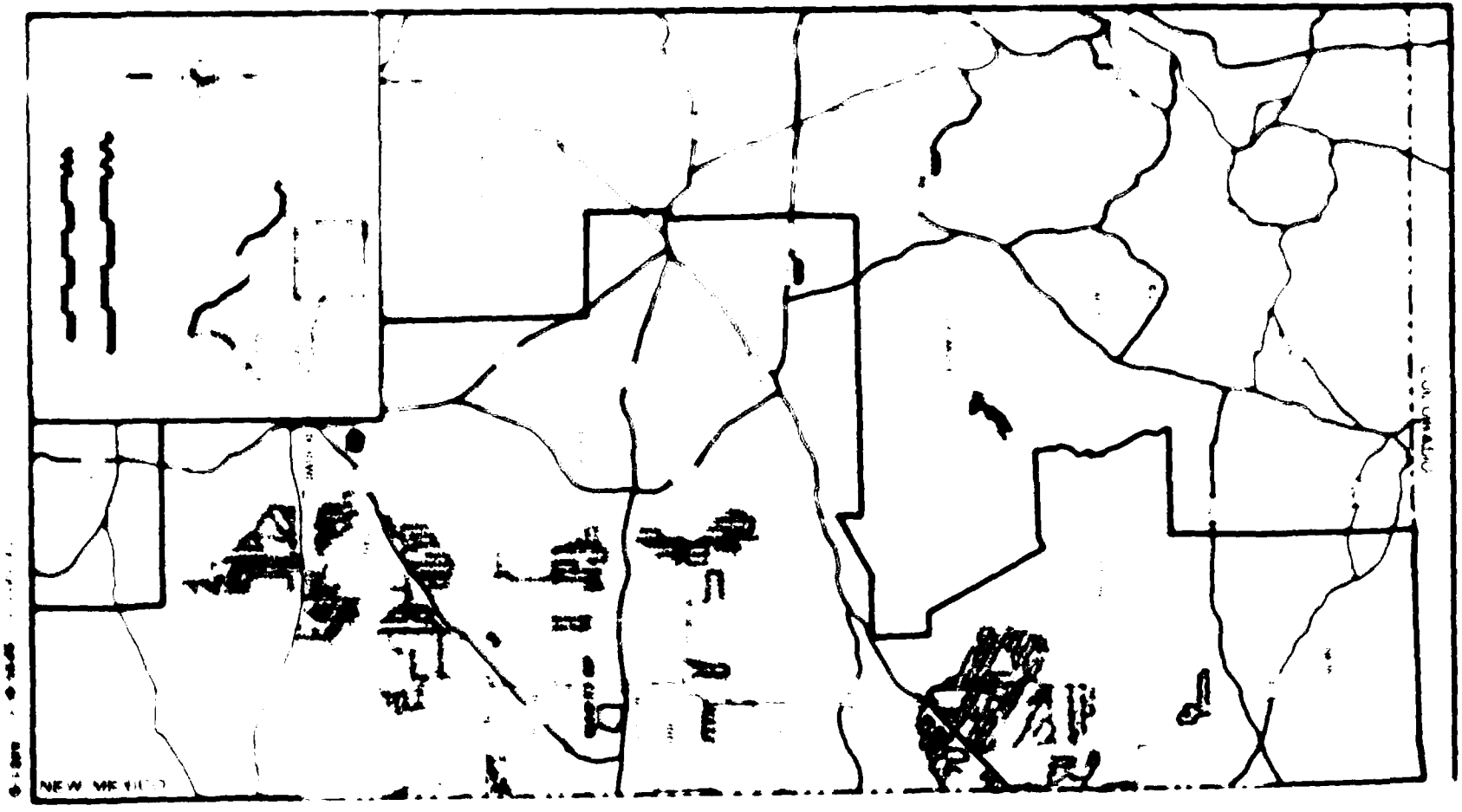

OKLAHOMA
TEXAS
AMARILLO
LUBBOCK
TEXAS

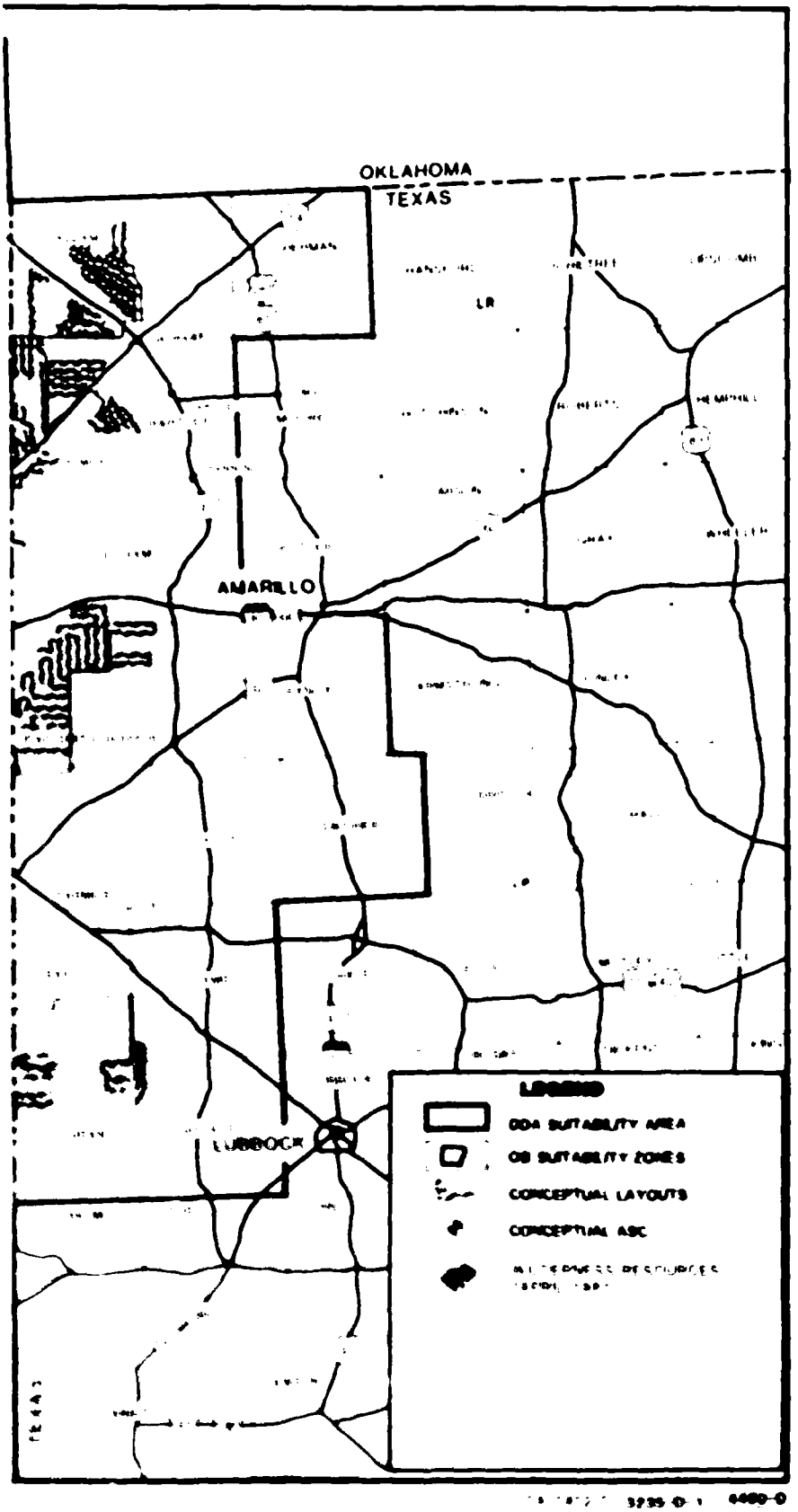
4.12 ALTERNATIVE 8






OREM
PROVO
LEGEND
NEVADA
UTAH




OKLAHOMA
TEXAS
AMARILLO
LUBBOCK
LEGEND
DDA SUITABILITY AREA
OB SUITABILITY ZONES
CONCEPTUAL LAYOUTS
CONCEPTUAL ASC

The ordinal ranking of these alternatives, shown in Table 4.13-1, was based upon the indirect effects index developed to predict wilderness resources most likely to be impacted by recreation-related impacts and was calculated by using the non-parametric statistical scheme known as the Kendall's Tau Correlation Analysis (Section 4.2.7). The split basing Alternative 8 would be the next preferred alternative, despite the fact that the Coyote Spring base suitability zone overlaps six surrounding designated wilderness study areas. This alternative reduces project-related population growth and reduces the number of hydrologic subunits containing project elements by approximately 55 percent over full basing. Since there is the potential for direct project overlap with wilderness resources under review at the Coyote Spring site, the remaining full-basing alternatives, which share this OB site, are considered essentially equivalent. However the ranking, according to the indirect effects index discussed above, shows some differentiation between these remaining full basing alternatives, with the smallest population-related effects on the wilderness resource under Alternative 6 (Milford/Coyote Spring), followed by Alternatives 4 and 2, with the Proposed Action and Alternative 1 having the highest potential for recreational impacts to wilderness resources.

Table 4.13-1. Ranking of alternatives based on Kendall's Tau correlation analysis.

Rank By Kendall's Tau	Alternative Number	OB Base Pairs	Kendall's Tau Correlation Coefficients
1	3	Beryl/Ely	0.266
2	5	Milford/Ely	0.212
3	6	Milford/Coyote	0.123
4	4	Beryl/Coyote	-0.016
5	2	Coyote/Delta	-0.126
6	1	Coyote/Beryl	-0.144
	PA	Coyote/Milford	

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[1]The higher the correlation coefficient, the less the potential impact.

5.0 PRINCIPAL IMPACTS TO SIGNIFICANT NATURAL AREAS

5.1 NEVADA/UTAH

Significant natural areas in the Nevada/Utah study area are expected to be impacted directly from effects of project construction and indirectly from project-related population increases. Where project siting occurs within the boundaries of SNAs, direct impacts could be long term and possibly irreversible; outside the boundaries (but in the vicinity) of SNAs impacts would be short term, continuing only for the duration of construction activities. Indirect impacts would continue for the life of the project, peaking when construction schedules for the system and the operating bases overlap and declining during the operations phase when construction has been completed.

Direct impacts from construction of bases, clusters, shelters, roads, and other support facilities would include loss or deterioration of habitats, alteration of genetic diversity, loss of areas for scientific research and education, destruction of ecological or geological features, disturbance of wildlife, and deterioration of air quality.

Indirect impacts would arise primarily from recreational activities of project construction and operation personnel. They may be short- or long-term. Increased demand for access to natural resources for touring, hiking, camping, hunting, other outdoor activities, and competition for licenses and permits may strain the capabilities of managing agencies to implement protective policies. BLM policies for management of formally classified areas, in general, exclude activities that would disturb the special features for which the areas were designated. Because present user demands are generally low and high enforcement levels are not necessary, implementation of most policies are largely limited to the publication of restrictions in the Federal Register, in brochures and other media, to periodic surveillance patrols, and to posted notices. This applies to most designated areas such as National Natural Landmarks and Research Natural Areas. Wildlife Management Areas under BLM management are protected by additional measures: mining is not permitted, as most WMAs are withdrawn from mineral entry; ORV use is controlled (ORV problems are not great at present); and seasonal closings occur where an area receives excess visitation. In most cases, protection of an area depends upon the discretion of individual managers. In designated areas managers are obliged to implement measures that will ensure that policy objectives will be met. Although at present a high level of enforcement measures is not necessary, "the mechanism exists to protect these areas" (Goichoechea, 1981). BLM's Las Vegas District, Nevada, is updating a "Management Framework Plan" that will be implemented within the next ten years; by 1986 several areas including Pine Creek, Sunrise Mountain, and Virgin Peak are expected to be under a recreation management plan.

USFWS management policies for National Wildlife Refuges are rigorously enforced. In addition to the publication of regulations in the Federal Register and other media, enforcement is carried out by each refuge manager and by a designated law enforcement staff who operate under the USFWS policy that "public use on refuges will be secondary to the primary purpose of management for wildlife" (USFWS, 1976). Access to refuges is controlled, where necessary, by fencing and by

seasonal closings; for some (Ruby Lake, for example), restrictions on certain types of activities are imposed during the nesting season. Limitations on the number of users may be placed where areas receive a heavy demand, with the maximum set by individual managers. Hunting and fishing are limited by the number of licenses issued. Where a refuge provides habitats for threatened or endangered species, freedom of public use may be greatly curtailed. Each National Wildlife Refuge is managed to protect its own special characteristics; regulations are imposed to meet conditions on each area.

Policies for the protection of state Wildlife Management Areas generally parallel those for National Wildlife Refuges. Implementation of those policies by area caretakers includes fencing, seasonal closings, limited access where necessary, and hunting and fishing licenses. In Nevada regulations for hunter use are currently more restrictive on Wildlife Management Areas in the eastern part of the state (including the study area) than in the western side (Molini, 1981). Several Wildlife Management Areas do not have full-time caretakers. For those areas state Departments of Wildlife personnel make periodic visits for monitoring purposes.

Most significant natural areas managed by the National Park Service and by the U.S. Forest Service are located within National Parks and Forests. Several National Natural Landmarks, Research Natural Areas, and unclassified Other Natural Areas identified in this study are managed by these agencies. The Desert Experimental Range in Utah, managed by the USFS, is an area reserved as an agricultural range experiment station; the entire tract, withdrawn from mineral entry, is fenced. Management policies developed and implemented for recreational use would apply to those SNAs in public parks and forests (owners of Registered National Natural Landmarks have agreed to preserve the special characteristics of these Landmarks).

Potential general impacts to significant natural areas from various project parameters are summarized in Table 5.1-1. Figure 5.1-1 shows locations of significant natural areas in the proposed deployment area and the conceptual project layout. For discussions of impacts to biological resources, see ETR-14, Native Vegetation; ETR-15, Wildlife; ETR-16, Aquatic Species; and ETR-17, Protected Species.

Direct effects of M-X deployment on significant natural areas were calculated from computer-generated resource maps prepared and digitized as were those for Wilderness (see Methodology). More than 55,000 acres of significant natural areas would be directly impacted by construction and operation of the proposed project (Table 5.1-2). Most of this occurs in Snake and Hot Creek hydrologic subunits, where approximately 8,000 acres of Deep Creek Mountains in Utah and 40,000 acres of Hot Creek Range in Nevada would contain cluster roads and shelters; both SNAs are potential National Natural Landmarks. Hot Creek Range, in process of nomination, is presently remote, wild, and essentially natural. It is of considerable interest to geologists, and one of the best known composite ranges in the Great Basin (Bostick et al., 1975). M-X siting here would permanently destroy ecological and geological features that not only typify the Great Basin, but which also serve as study areas for scientists and educators. The Deep Creek Mountain Range is high and outstanding with many natural features. M-X deployment here would open up an area that is relatively unknown with a resulting destruction of those natural features for which it is valued. The proposed Great Basin National Park study area, which spans portions of Spring, Snake, and Hamlin subunits, is currently under

Table 5.1-1. Potential impacts to significant natural areas from various project parameters (Page 1 of 2).

Project Parameter	Potential Impacts
Area Disturbed	Degradation in aesthetic quality where project construction is visible and where the presence of people and machinery cause increased noise levels. Increased construction activities will tend to concentrate diurnally feeding waterfowl within the refuge for longer periods of time resulting in a depletion of aquatic feeding ducks such as teal; grazing waterfowl (i.e. mallards and geese) will graze adjacent fields at night, while the puddle ducks (i.e. teal) will suffer from increased forage competition during the day. Potential for alteration of surface runoff patterns affecting the water supply of waterfowl areas and sensitive aquatic ecosystems. Potential for runoff carrying increased sediment loads as a result of vegetative cover loss. Potential for runoff contaminated by construction-related pollutants--oil, grease, gasoline.
Water Use	Lowering of water table with potential loss of surface water in lowland areas which might be connected through connecting drainage systems. Potential loss of riparian and aquatic habitat resulting in a concentration of people in remaining areas.
Vehicle Traffic	Degradation in air quality and increased audible noise pollution in those areas through or near which vehicle traffic increases. Potential for disturbance of wildlife behavior patterns.
People	Increased visitation and hunting pressures resulting in: Increased use and misuse of resources. Disturbance to vegetation due to compaction. Habitat destruction through vegetation removal, soil compaction and resultant erosion. Illegal harvesting/collecting.

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Table 5.1-1. Potential impacts to significant natural areas from various project parameters (Page 2 of 2).

Project Parameter	Potential Impacts
People (cont'd.)	Changes in animal behavior patterns due to habitat loss and increased noise levels.
	Concentration of wildlife with overgrazing and overbrowsing.
	Increased fishing pressure.
	Potential for decrease in animal populations through poaching.
	Increased litter and sanitation problems, attraction of nuisance organisms.
	Increased economic benefits because of concessions and other visitor related services.
Security	Specific effects to be determined in Tier 2 studies.

T4798/9-24-81/F

Table 5.1-2. Direct impacts to significant natural areas, Nevada/Utah potential deployment area.

Hydrologic subunit		Approximate SNA acres in subunit	
Number	Name	Total	Disturbed
4	Snake, Nev./Utah	238,649	7,630
5	Pine, Utah	55,911	1,860
6	White, Utah	900	0
7	Fish Springs, Utah	17,000	0
8	Dugway Creek, Utah	--	--
9	Government Creek, Utah	--	--
66	Sevier Desert, Utah	16,710	--
66A	Sevier Desert-Dry Lake, Utah	6,900	
90	Milford, Utah[1]	--	--
92	Lund District, Utah[1]	7,680	0
93	Beryl-Enterprise, Utah[1]	--	--
96	Wah Wah, Utah	--	--
137A	Big Smoky/Tonopah Flat, Nev.	3,361	0
139	Kobeh, Utah	25,629	315
140A	Monitor-North, Nev.	2,080	0
140B	Monitor-South, Nev.	1,690	0
141	Ralston, Nev.	929	0
142	Alkali Spring, Nev.	--	--
148	Cactus Flat, Nev.	--	--
149	Stone Cabin, Nev.	33,000	90
150	Antelope, Nev.	--	--
154	Newark, Nev.	--	--
155A	Little Smoky-North, Nev.	--	--
155B	Little Smoky-South, Nev.	355	0
156	Hot Creek, Nev.	215,860	99,960
170	Penover, Nev.	2,805	190
171	Coal, Nev.	895	125
172	Garden, Nev.	62,894	0
173A	Railroad-South, Nev.	--	--
173B	Railroad-North, Nev.	66,955	605
174	Lakes, Nev.	--	--
175	Long, Nev.	--	--
178B	Butte-South, Nev.	995	0
179	Steptoe, Nev.	7,135	0
180	Cave, Nev.	16,130	0
181	Dry Lake, Nev.	11,120	0
182	Delamar, Nev.	34,790	0
183	Lake, Nev.	22,270	0
184	Spring, Nev.	67,810	0
196	Hamlin, Nev./Utah	2,389	0
202	Patterson, Nev.	--	--
205	Meadow Wash, Nev.[1]	175,800	--
207	White River, Nev.	66,135	0
208	Pahroc, Nev.	--	--
209	Pahranagat, Nev.	38,350	0
210	Coyote Spring, Nevada[1]	197,369	3,335
219	Muddy Springs, Nevada[1]	7,015	3,335
Total acres disturbed, system			50,565
Total acres disturbed, bases			6,670
Grand total			57,215

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[1]Hydrologic subunit associated with DB.

review with the NPS and the DOI (Bain, 1981). Because project siting has avoided this proposed state park area, no direct impacts within its boundaries. In Coyote Spring and Muddy Springs, a total of more than 6,000 acres of Arrow Canyon Range (more than 50 percent) would be within the potential Coyote Spring OHV suitability zone. Arrow Canyon Range is a proposed state park. Direct impacts of lesser magnitude would occur in eight other hydrologic subunits as one or more project features would cross SNA boundaries. These include the Desert Experimental Range in Pine, Antelope Spring Ecologic Reserve in Sevier Desert and Sevier Desert-Dry Lake, Roberts Mountains in Kobeh, McCann Canyon Geologic Area in Stone Cabin, Leviathan Cave in Pennoyer, Coal Valley in Coal, and Railroad Valley Wildlife Management Area in Railroad-Northeast.

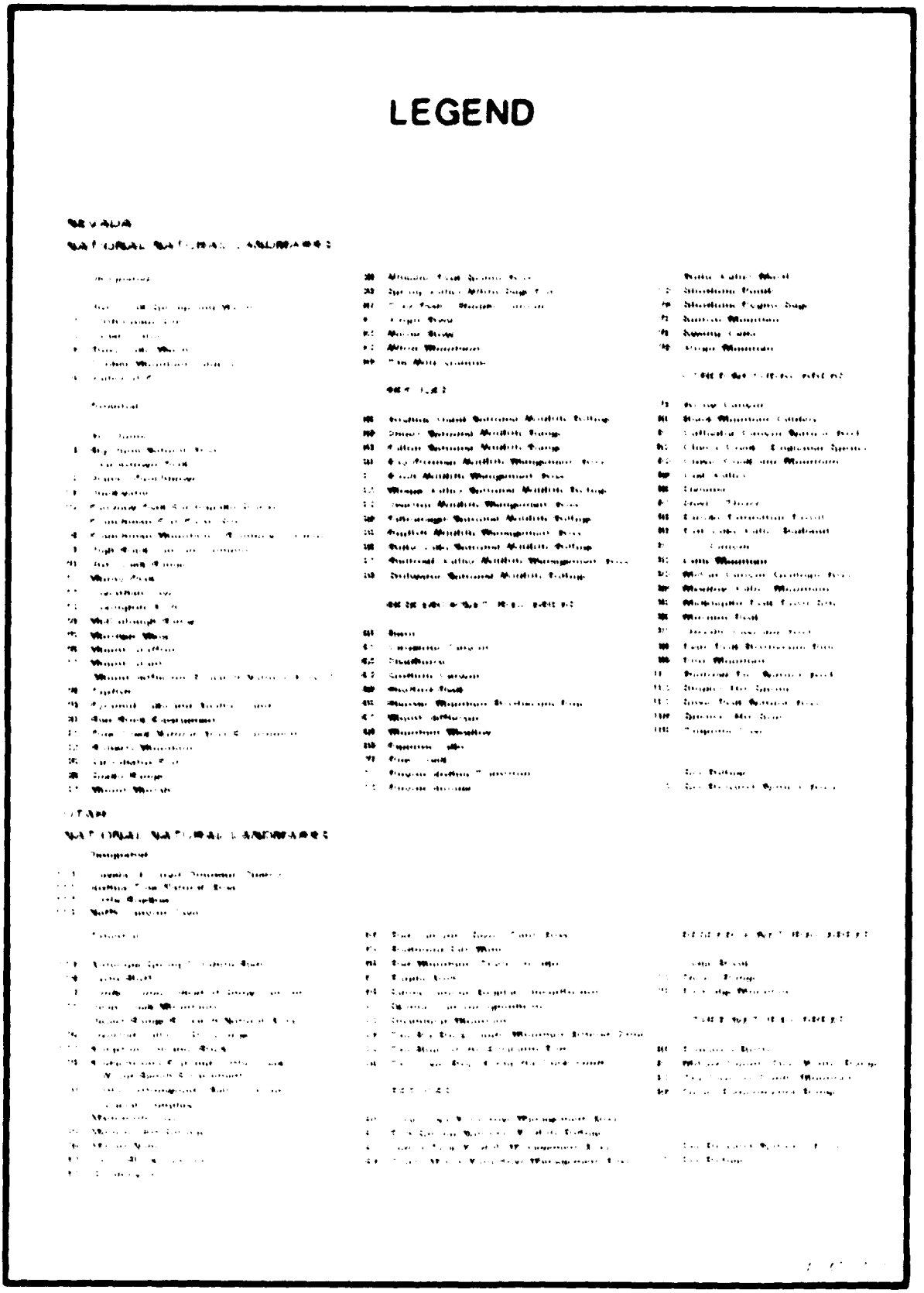
Indirect impacts to significant natural areas are expected to vary according to their distances from construction camps and operating bases, proximity of alternative areas for recreation, general SNA attraction, and effectiveness of management policies. Table 5.1-1 shows estimated MX population-related indirect impacts to SNAs in the Nevada/Utah deployment area for construction and operation phases of the proposed projects.

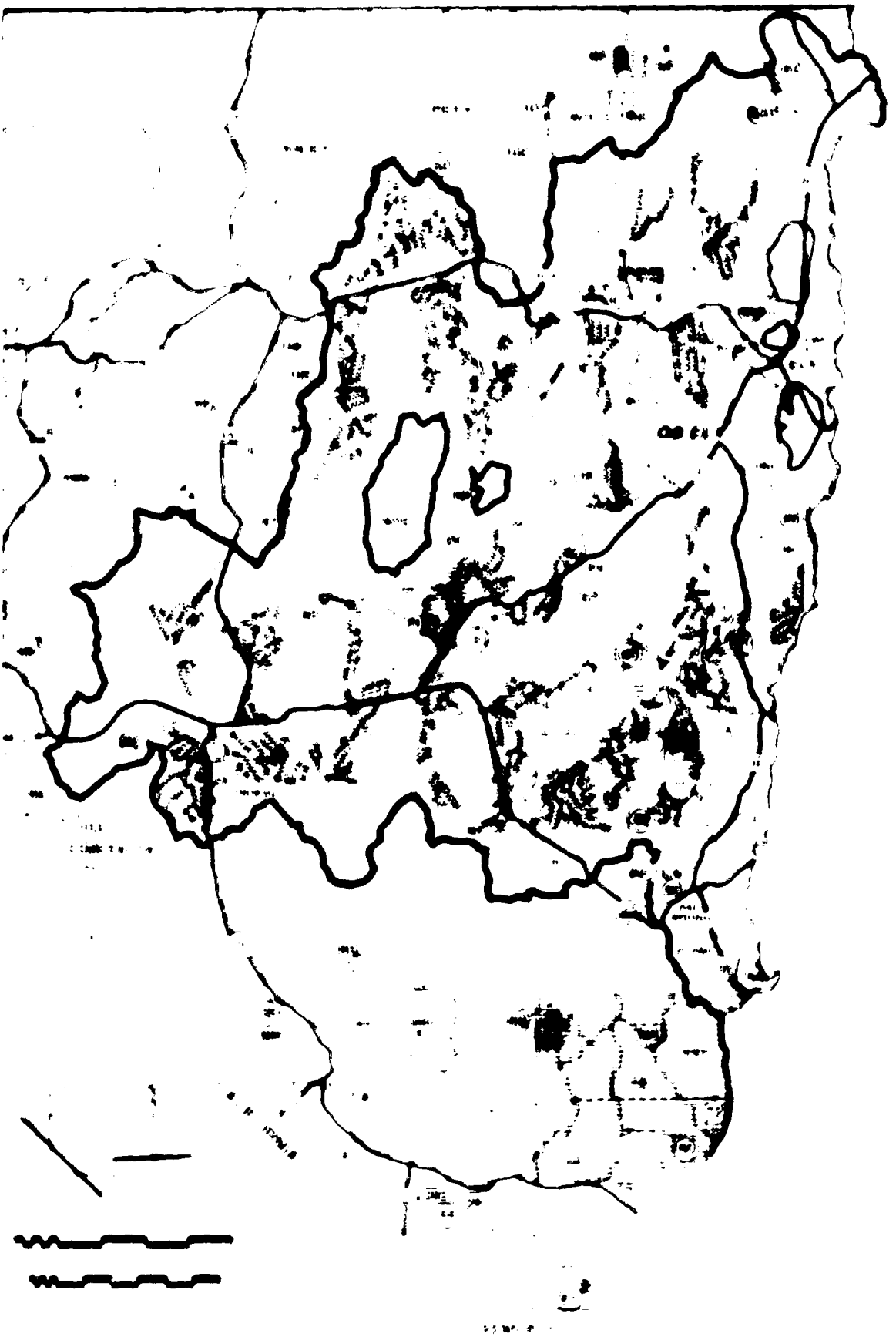
Analysis of indirect impacts within hydrologic subunits considered (1) presence of construction camp or operating base, (2) camp or base distance from SNAs, (3) total acres of SNAs, (4) acres of individual SNAs, (5) classification of SNAs, and (6) proximity of state and national parks and forests and other recreation areas.

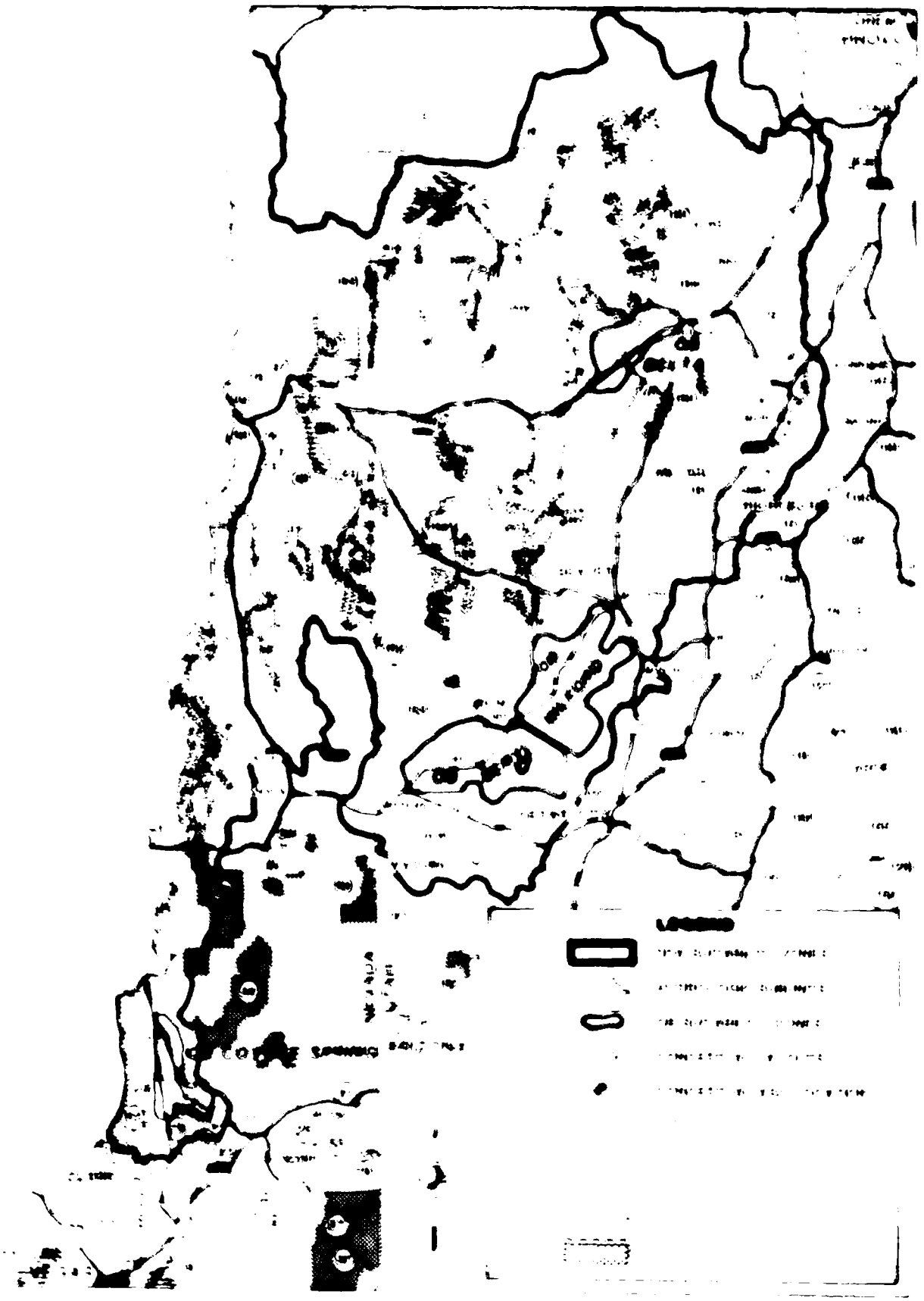
A 50 air-mile radius was chosen as an initial distance limit of impact for several reasons. First, significant natural areas, in general, are not expected to receive the level of user demand associated with state and national parks and forests, wilderness, and various recreation areas. With the exception of highly publicized and attractive SNAs, most indirect impacts would probably occur within relatively short distances. Second, air-mile distances are shorter than actual driving distances which increase exponentially with distance from their origins. An SNA 50 air-miles from a camp or base could be at an actual driving distance two to three times greater. Third, for simplicity; to include SNAs within a 100 air-mile radius, for example, would result in such a level of redundancy that a comparison of impacts between camps or bases would lose its clarity. Finally, the 50 air-mile distance was not an absolute limit. SNAs of particular attraction at greater distances were considered in the analysis.

Because sensitivity to impact and management policy vary among and between SNAs, indirect impacts are not amenable to analysis by formula or computer modeling. Thus, determinations of high, medium, and low impacts to hydrologic subunits were made using a "best judgment" approach, factoring in all of the considerations described above. Distance between an SNA and construction camp (or operating base) was the first consideration; an SNA within 25 mi would automatically be assigned a high impact. However, its size, sensitivity, or attractiveness could modify the potential impact. For example, an SNA of 50,000 acres or more within 25 mi would be large enough to accommodate all the construction workers from several camps with a resulting low impact; an SNA of less than 10,000 acres (all else being equal) would probably receive a high impact. Conversely, an SNA 50 mi or more from a camp would receive a low impact modified by size and appeal considerations. Management policies would result in different impacts for otherwise similar SNAs; generally, USFWS-managed refuges probably would not be impacted to the same degree as potential National Natural Landmarks. Determination of impact for an entire hydrologic subunit was generally

LEGEND







BERYL

Operation from the Beryl, Utah OB may result in high indirect impacts to SNAs in Pine and Long Distance subunits of Utah. Steamboat Mountain, a potential National Natural Landmark (in Long Distance), is a short distance from the center of the OB suitability zone (Table 5.1-4). The mountain, a relatively pristine area of coniferous forest and woodland, connects to Needle Range and Wah Wah Mountains; all are geologically significant and attractive. Indian Peak Wildlife Management Area in Pine is one of a few refuges that has no resident caretaker. It is an attractive hunting area for deer, elk, small mammals, and upland game. Pressure for hunting licenses (and special permits for elk) would adversely affect the resident human populations. Deer and upland game hunting may have to be limited (Woodruck, 1981). Impacts are expected to be low in other subunits. In Meadow Basin, Nevada, Clover Creek and Mountains is part of more than 140,000 acres of SNAs, sufficient to accommodate a high level of user demand. Desert Experimental Range and Desert Range Research Natural Area are well protected. Ripple Area, Red Mountain, and Inverted Valleys, not in the potential deployment area, are protected or inaccessible. Proximity of the Beryl site to Dixie National Forest, Zion National Park, Bryce Canyon, and other recreational areas suggests a focus of user demand directed toward those areas.

COYOTE SPRING

From the Coyote Spring, Nevada OB population related impacts are expected to be high in Muddy Springs and Coyote Spring subunits. Arrow Canyon Range (already heavily impacted by the potential OB, and proposed as a state park), Meadow Valley Mountains, Pinyon-Juniper Research Natural Area, Deadhorse Research Natural Area, and Moapa Valley National Wildlife Refuge are all expected to receive heavy recreational pressure because of their proximity to the potential OB site (Table 5.1-5). Impacts would be high in Arrow Canyon Range and Meadow Valley Mountains; both are unclassified areas and, as such, may not receive the degree of protection afforded classified areas. The Desert National Wildlife Range in the Pahranagat subunit virtually abuts the west boundary of the OB site. Awareness would be high but an existing effective INRMP management policy should keep impacts to a moderate level. Moapa Valley NWR in Muddy Springs, Pahranagat NWR and Key-Pittman WMA in Pahranagat North, and Overton WMA outside the proposed deployment area would all experience increased competition for biological resources which would have an adverse impact on resident populations. With additional enforcement officers which probably would be necessary with MX deployment, it is expected that enforcement mechanisms would be adequate to prevent a high level of impacts. Impacts to other SNAs within the 50 air mile radius are expected to be moderate to low (see Table 5.1-3). Proximity of the Coyote Spring OB to Las Vegas, Lake Mead National Recreation Area, Toiyabe National Forest, the Grand Canyon, and other recreational areas would facilitate the movement of recreational activities away from the more sensitive SNAs.

DELTA

Base siting at Delta, Utah may result in high indirect impacts in the Sevier Desert and Sevier Desert-Dry Lake hydrologic subunits, and moderate impacts in White, Fish Springs, and Little Smoky-Swasey in Nevada (see Table 5.1-2). Topaz Marsh Waterfowl Management Area is an undeveloped wetland utilized by waterfowl

Table 5.1-4. Significant natural areas within a 50 air-mile (80 km) radius of the potential Beryl OB site.

Significant Natural Area	Approximate Distance from OB Site	
	Miles	km
Nevada		
Clover Creek and Mountains	35	55
Utah		
Steamboat Mountain	10	15
Indian Peak Wildlife Management Area	25	40
Ripple Arch	45	70
Red Mountain	45	70
Desert Range Research Natural Area	50	80
Desert Experimental Range	50	80
Inverted Valleys, St. George	50	80

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Table 5.1-5. Significant natural areas within a 50 air-mile (80 km) radius of the potential Coyote Spring OB site.

Significant Natural Area	Approximate Distance from OB Site	
	Miles	km
Nevada		
Arrow Canyon Range	0	0
Desert National Wildlife Range	5	10
Pinyon-Juniper Research Natural Area	10	15
Meadow Valley Mountains	10	15
Deadhorse Research Natural Area	15	25
Moapa Valley National Wildlife Refuge	15	25
Basin Research Natural Area	20	30
Hayford Peak Research Natural Area	20	30
Weiser Bowl	25	40
Mormon Peak	25	40
Delamar	25	40
Pahranagat National Wildlife Refuge	30	50
Valley of Fire National Natural Landmark	30	50
Overton Wildlife Management Area	35	55
Virgin River	35	55
Gold Butte	45	70
Virgin Mountain Research Natural Area	50	80
Devil's Throat	50	80
Papoose Lake Research Natural Area	50	80
Key-Pittman Wildlife Management Area	50	80
Utah		
None		

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and shore birds with unlimited public access; there is no caretaker in residence but it is visited periodically by the local conservation officer (Drobnick, 1981). Although the Utah Division of Wildlife would implement restrictions on use if population demands require such action, potential impact would be high because of its short distance from the base site. Recreational impacts to Antelope Spring Trilobite Beds, a potential National Natural Landmark, and to Fumarole Butte, one of the oldest active volcanic vents in the United States, are also expected to be high. Both attract visitors and are relatively small areas, easily accessible. Because they are not officially classified they may not receive the degree of protection that an M-X-related population increase would warrant. Clear Lake Waterfowl Management Area is fenced and employs a full-time caretaker. Scenic attraction is not high. During the nesting season access is limited. Bird watching is a principal activity at Clear Lake which also supports bald eagle roosting sites. M-X population impacts probably would be moderate; hunting limits and additional enforcement measures may be required. Effective management policies implemented at some SNAs within a 50 air-mile radius and large size at others would tend to reduce potential indirect impacts (Table 5.1-6). In the Little Smoky-South subunit, well beyond the 50 air-mile radius, Lunar Crater may draw enough M-X visitors to create a moderate impact.

ELY

Base siting at Ely is expected to result in high population-related impacts to the Railroad-North, and Spring hydrologic subunits (see Table 5.3-1). Duckwater is a highly sensitive ecosystem in Railroad-North which contains habitats for several rare or endemic species, including the Railroad Valley spring fish. A pond on the site is one of only two places where red-legged frogs have been found in Nevada. Although approximately 50 air-miles from the proposed Ely base, Duckwater is considered highly vulnerable, as there is "an everpresent threat that someone will introduce exotic predators into this closed ecosystem" (Bostick et al., 1975). In the Spring subunit, Osceola Cave and Arch, and Eureka Formation Fossils, both unclassified areas within 25 air-miles of the base site, may not receive enough protection from increased visitation. Indirect impacts at Wheeler Peak Scenic Area, a highly publicized and attractive potential National Natural Landmark, would probably be high as the area is only 35 air-miles from the Ely site (Table 5.1-7). Other SNAs in the Steptoe, Snake, Hamlin, and White River subunits are expected to receive moderate to low impacts. Heusser Mountain Bristlecone Pine RNA, ten miles from the proposed base, is located high on the steep western slopes of the Egan Range; accessibility is extremely difficult. Impacts to most other areas would be reduced by their large areas, by effective management policies, or by inaccessibility (to reach the Caves of Gandy Mountain in the Snake subunit, for example, one would be required to drive around a mountain range). An increase in the demand for wildlife resources at Kirch and Railroad Valley Wildlife Management Areas, both beyond 50 air-miles from the base, is expected to be significant enough to require additional enforcement measures.

MILFORD

Indirect impacts from base siting at Milford, Utah are expected to be high in Steamboat Mountains in the Lund District hydrologic subunit, and in the Indian Peak Wildlife Management Area in the Pine subunit (Table 5.1-8). Discussion for the Beryl site would apply here. The Desert Experimental Range and Desert Range

Table 5.1-6. Significant natural areas within a 50 air-mile (80 km) radius of the potential Delta OB site.

Significant natural area	Approximate distance from OB site	
	Miles	km
Nevada		
None	--	--
Utah		
Topaz Marsh Waterfowl Management Area	15	25
Antelope Spring Trilobite Beds	15	25
Clear Lake Waterfowl Management Area	20	30
Fumarole Butte	25	40
Kolob Mesa Research Natural Area	35	55
Partridge Mountain Research Natural Area	40	65
Fish Springs National Wildlife Refuge	45	70
Deep Creek Mountains	50	80

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Table 5.1-7. Significant natural areas within a 50 air-mile (80 km) radius of the potential Ely OB site.

Significant Natural Area	Approximate Distance from OB Site	
	Miles	km
Nevada		
Heusser Mt. Bristlecone Pine Research Natural Area	10	15
Eureka Formation Fossils	25	40
Spring Valley White Sage Flat	25	40
Swamp Cedar Research Natural Area	25	40
Osceola Cave and Arch	25	40
Shoshone Pygmy Sage Research Natural Area	30	50
Mount Moriah	30	50
Snake Range	30	50
Cathedral Canyon Natural Arch	35	55
Shoshone Ponds Research Natural Area	35	55
Wheeler Peak Scenic Area	35	55
Mount Grafton	40	65
Goshute Canyon Research Natural Area	50	80
Duckwater	50	80
Lexington Arch	50	80
Kirch Wildlife Management Area	50	80
Utah		
The Caves of Gandy Mountains	45	70
Deep Creek Mountains	50	80

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Table 5.1-8. Significant natural areas within a 50 air-mile (80 km) radius of the potential Milford OB site.

Significant Natural Area	Approximate Distance from OB Site	
	Miles	km
Nevada		
None	--	--
Utah		
Steamboat Mountains	25	40
Indian Peak Wildlife Management Area	30	50
Desert Experimental Range	40	65
Desert Range Research Natural Area	40	65

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RNA are well protected. As with the Beryl site, proximity to Zion National Park, Dixie National Forest, and other recreation areas would reduce population pressures to SNAs nearby.

5.2 TEXAS/NEW MEXICO

As in the Nevada/Utah potential deployment area, impacts to significant natural areas in Texas/New Mexico could occur directly from construction and operation, and indirectly from increased recreational use. Because most of the Texas/New Mexico High Plains region is either intensively cultivated or heavily used as rangeland, the few remaining natural areas are of great importance. Several of these lie within the deployment area and could be directly impacted by construction and operation (Figure 5.2-1).

Direct impacts were estimated from computer generated maps prepared and digitized in the same manner as those for Wilderness (see Methods section). Of the more than 250,000 acres of SNAs in the Texas/New Mexico potential deployment area, approximately 3,000 acres would be directly impacted by construction of M-X shelters and roads (Table 5.2-1). In Dallam County, Texas, project siting in Buffalo Springs potential National Natural Landmark and in Rita Blanca National Grasslands could destroy approximately 2,000 acres. In New Mexico, construction at Claudell, Gallena Wells Tracts, and in the Marshall Wildlife Management Areas in Roosevelt County, as well as Mescalero Sands potential National Natural Landmark in Chaves could result in more than 900 acres destroyed.

Buffalo Spring is a privately owned series of live springs and marshy habitat near the headwaters of Coldwater Creek. The area circled on Fig. 5.2-1, considerably larger than the actual Buffalo Springs potential National Natural Landmark, is for general locational purposes; most of the area is within Rita Blanca National Grasslands and is already encroached on by grazing. Of the area shown on Figure 5.2-1 as Rita Blanca National Grasslands, 70,000 acres are managed by the USFS. The remaining area, more than 200,000 acres, is privately owned. Direct impacts from construction could occur to USFS-managed as well as privately owned sections of the Grasslands.

Claudell, Gallena Wells Tracts, and Marshall Wildlife Management areas are state-managed Federal Aid Wildlife Restoration Projects funded through the USFWS. These Wildlife Management Areas, including several others listed in Table 3.2-2, were acquired by New Mexico's Game and Fish Department to provide restoration areas for the lesser prairie chicken. These populations have been adversely impacted in other states where much of their former range has been turned into agricultural land. Construction of the M-X system in these areas would destroy a large portion of their remaining habitat.

Mescalero Sands, in nomination as a National Natural Landmark, is part of a larger unit that was recently under BLM wilderness consideration. It is composed primarily of low rolling sand dunes stabilized by a heavy cover of shinnery oak vegetation. After much study and public controversy, the unit was dropped from further wilderness consideration. However, Mescalero Sands has been identified by BLM as a special area in need of protection and careful management. M-X construction would destroy portions of an area of cultural, scientific, and scenic values, as well as one of great public interest.

Table 5.2-1. Direct impacts to significant natural areas, Texas/New Mexico potential deployment area.

State/County	Approximate SNA Acres By County	
	Total	Disturbed
Texas		
Bailey	5,800	0
Castro	--	--
Cochran	--	--
Dallam	70,000+	2,000
Deaf Smith	--	--
Hale	--	--
Hockley	--	--
Lamb	--	--
Lubbock	--	--
Moore	--	--
Oldham	--	--
Parmer	--	--
Potter	--	--
Randall	24,300	0
Sherman	--	--
Swisher	--	--
New Mexico		
Chaves	29,100	800
Curry	--	--
DeBaca	--	--
Guadalupe	80	0
Harding	34,400	0
Lea	640	0
Quay	7,000	0
Roosevelt	18,800	100
Union	68,200	0

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LEGEND

TEXAS

NATIONAL NATURAL LANDMARKS

RESEARCH NATURAL AREAS

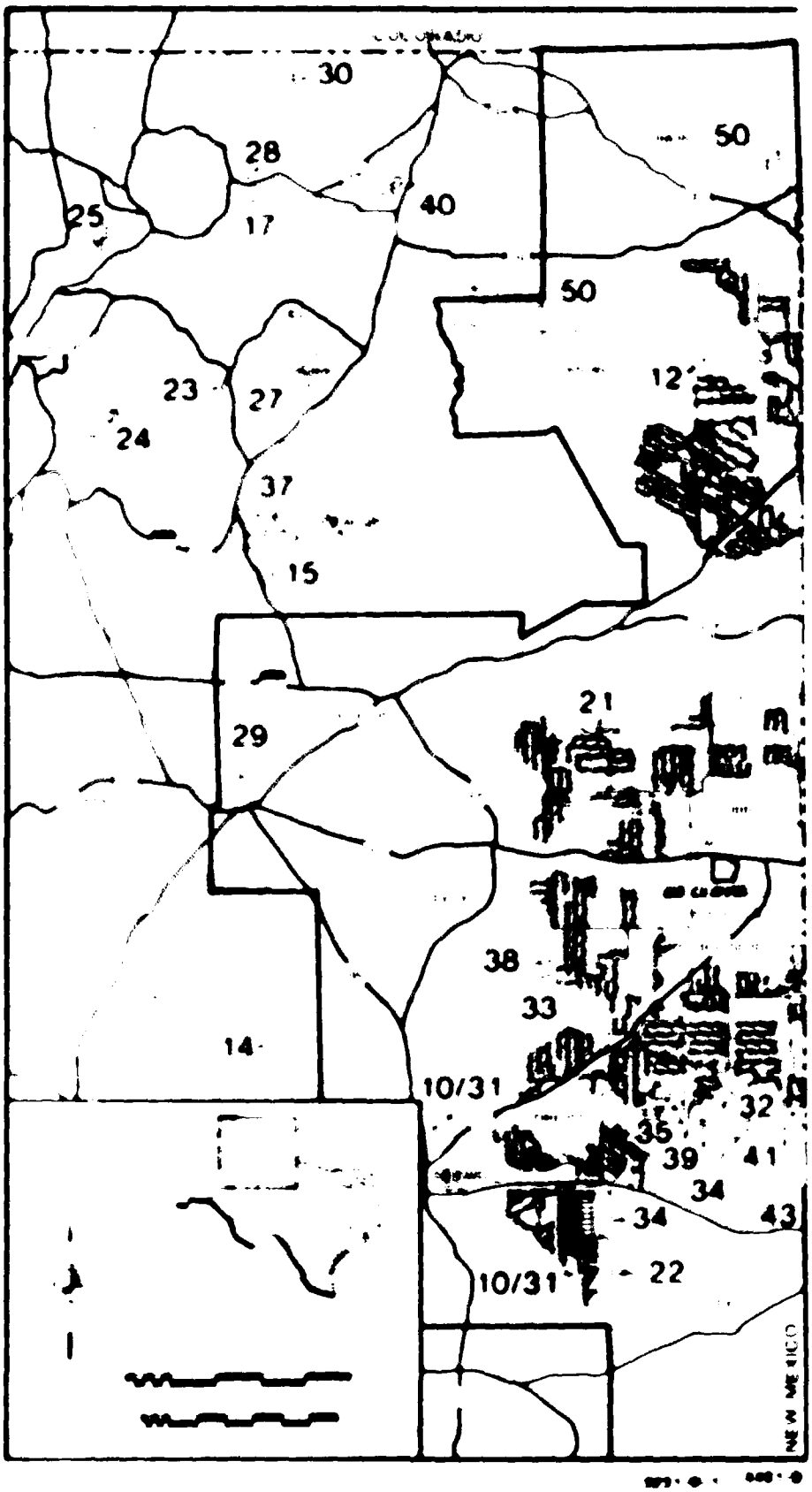
GRASSLANDS

NEW MEXICO

NATIONAL NATURAL LANDMARKS

RESEARCH NATURAL AREAS

GRASSLANDS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NEW MEXICO

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Table 3.2-3. Potential population-related indirect impacts in SNAs during construction and operation, Texas-New Mexico deployment area.

State / county	SNA Acres	Indirect Impacts[1] Full-Basing		
		Construction	Operation (CNS Alternatives)	
			Clovis	Dalhart
Texas				
Bailey	1,800	*****	***	*
Castro	-	-	-	-
Cochran	-	-	-	-
Dallam	10,000+	***	*	*
Deaf Smith	-	-	-	-
Hale	-	-	-	-
Hockley	-	-	-	-
Lamb	-	-	-	-
Lubbock	-	-	-	-
Moore	-	-	-	-
Oldham	-	-	-	-
Parmer	-	-	-	-
Pecos	-	-	-	-
Randall	24,000	*****	***	***
Sherman	-	-	-	-
Swisher	-	-	-	-
New Mexico				
Chaves	29,100	*****	***	*
Curry	-	-	-	-
De Baca	-	-	-	-
Guadalupe	80	*	*	*
Harding	16,400	*	*	*
Lea	440	*****	*	*
Quay	1,200	*	*	*
Roosevelt	18,800	*****	***	*
Union	48,200	*	*	*

[1] Key to Indirect Impacts:

- - No impact.
- * - Low impact.
- *** - Moderate impact.
- ***** - High impact.

Analysis of indirect impacts also considered (1) presence of conservation camp or operating base, (2) camp or base distance from SNAs, (3) total acres of SNAs, (4) acres of adjoining SNAs, (5) classification of SNAs, and (6) proximity of state and national parks and forests and other recreation areas.

the more than 70,000 acres of Rita Blanca National Grasslands would probably be able to absorb M-X increased population pressures.

PUBLIC COMMENTS ON THE DRAFT EIS:

"The number of acres required would not cause a significant reduction in the forage produced on the Rita Blanca National Grassland. Likewise the impact on wildlife habitat would be insignificant. Most of the soils in the affected ecosystems are suitable for this type of use.

"The demand for recreation by the additional people brought into the area as result of the project would dramatically increase. This demand could be accommodated as current recreation use is extremely low." (B0434-9-606)

SNAs in counties expected to receive low impacts are privately owned, of low attraction, or of high acreages.

Indirect impacts are expected to decline substantially during operation when most of the reduced M-X population would be stationed at two operating bases. As in the Nevada/Utah deployment area, the total full deployment population will increase to approximately 13,500 by 1989 and will remain at that level for the life of the project. More than half of this total will be stationed at the first OB complex (see ETR-31, Construction).

CLOVIS

Indirect impacts were estimated as were those for the Nevada/Utah area. First OB siting at Clovis is expected to result in moderate impacts to Bailey and Randall counties in Texas, and to Chaves and Roosevelt counties in New Mexico (see Table 5.2-2). Indirect impacts to all other counties are expected to be low or none. All SNAs within 50 air-miles of the Clovis site that would receive moderate impacts are wildlife refuges (Table 5.2-3). Grulla National Wildlife Refuge in Roosevelt would be the closest, at 25 air-miles. Enforcement mechanisms for state and USFWS management policies probably would be adequate to protect these areas at the reduced levels of M-X related user demand. Some additional enforcement personnel may be desirable. Mescalero Escarpment would not attract visitors to an important degree. The escarpment, produced by erosion, is the western rim of the High Plains. It is crossed by many highways and virtually invulnerable to deterioration.

The Buffalo Lake National Wildlife Refuge in Randall County, Texas is a highly attractive area of moderate size (see construction impacts). Although well outside the 50 air-mile radius, its many attractions would draw visitors and sportsmen from relatively long distances. Management policies are expected to be effectively enforced, and M-X population related impacts during operation would be moderate.

Moderate impacts may also be expected in Chaves County. Although Bitter Lake National Wildlife Refuge and Mescalero Sands are more than 50 air-miles from Clovis, their attractiveness, combined with a scarcity of alternative recreational facilities in the area probably would draw enough visitors from the Clovis site to exert a moderate degree of impact.

Table 3.2-1. Significant natural areas within a 50 air-mile (80 km) radius of the potential Clovis GR site.

Significant Natural Area	Approximate Distance from GR site	
	Miles	Km
Texas		
Muleshoe National Wildlife Refuge	44	70
New Mexico		
Ute Lake State Park	24	40
Yeso Hills Wildlife Management Area	34	55
Mescalero Escarpment	40	65
Liberty Wildlife Management Area	40	65
Marshall Wildlife Management Area	50	80
Indiana Tracts Wildlife Management Area	50	80
Blackwater Wildlife Management Area	50	80

DALHART

Operation personnel from the Dalhart site are expected to exert moderate impacts to Randall, and low to no impacts in all other counties in the Texas/New Mexico deployment area (see Table 5.2-2). Discussion of impacts to Randall resulting from the OB operation at Clovis applies here as well. SNAs within 50 air-miles of Dalhart are either extensive National Grasslands or privately owned National Natural Landmarks (designated or potential) (Table 5.2-4).

Table 5.2-4. Significant natural areas within a 50 air-mile (80 km) radius of the potential Dalhart OB site.

Significant Natural Area	Approximate Distance from OB Site	
	Miles	Km
Texas		
Rita Blanca National Grasslands	30	50
Buffalo Springs	40	65
New Mexico		
Bueyeros Shortgrass Plains	35	55
Kiowa National Grasslands	40	65

TS233/8-18-81

6.0 FUTURE TRENDS WITHOUT PROJECT

In the absence of M-X, several activities involving wilderness and significant natural areas may cause significant changes in land use in the Great Basin. The two most likely sources of change in the next 20 years center on the proposed Great Basin National Park Study Area and the BLM Wilderness Study Areas. The proposed study area of an undefined Great Basin natural recreation system (NPS) would attract additional recreationists into an essentially rural area if the site became a National Park. Such large numbers of people would need goods and services. The BLM Wilderness Study Area plans for the states of Nevada and Utah could eliminate as much as 3.5 million acres from current multiple use such as future mining and changes in grazing schedules from levels before designation.

In the Wilderness Act of 1964 (PL 88-577), Congress declared its policy "to secure for the American people of present and future generations the benefits of an enduring resource of wilderness." Only Congress can designate a "wilderness area" from federally administered lands, and once an area is so designated it must be managed in such a manner that the wilderness character is unimpaired and protected. Thus, by statute, identification of an area for wilderness review limits opportunities for development. The Wilderness Act recognized that certain activities are incompatible with the preservation of wilderness characteristics, and prohibits these activities in wilderness areas (16 U.S.C. 33 (c)):

> "Except as specifically provided for in this chapter, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this chapter and, except as necessary to meet minimum requirements for the administration of the area for the purpose of this chapter (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure of installation within any such area."

The Solicitor of the Department of Interior, in a memorandum (Sept. 5, 1978) to the Secretary of DOI, stated that "although Congress has not flatly considered that all developmental activity impacts the suitability of an area for wilderness preservation, it is difficult if not impossible to give meaningful illustrations of types of activities that will or will not impair the suitability of an area for wilderness preservation. For example, commercial timber harvesting has been held both to impair (Parker v. United States, 309 F. Supp. 593 (D. Colo. 1970)) and not necessarily to impair (Minnesota Public Interest Research Group v. Butz, 541 F. 2d 1292 (8th Cir. 1976) wilderness. The nature of the area and the extent of the proposed activity are the controlling factors."

Under Section 169A of the Clean Air Act (CAA) as amended (42 U.S.C. 74a) Congress established as a national goal "the prevention of any future, and the remedying of any existing impairment of visibility in mandatory Class I Federal areas which impairment results from manmade air pollution." Mandatory Class I areas include all National Wilderness Areas and Memorial Parks larger than 5,000 acres established at the time of the Clean Air Act Amendments (1977). Additional

proposed areas such as wilderness areas added to the NWPS after the CAA amendments can be redesignated to Class I Status by the state.

On May 22, 1980 the EPA proposed regulations for the visibility protection of Federal Class I areas and on July 23, 1980 issued proposed guidelines for state protection of such areas. These proposed regulations will be effective constraints on many stationary industrial sources of air pollution.

A key question regarding potential wilderness designation is the effects of development and growth. Wilderness and development are by definition mutually exclusive. Potential wilderness located within areas proposed for the M-X program, and development of other projects such as the Intermountain Power Project in Millard County, Utah, an alunite mine and processing plant in Beaver County, Utah; the Anaconda open pit molybdenum mine and mill in Tonopah, Nevada; the proposed White Pine Power plant and possible reopening of the Kennecott Copper Company smelting operation in White Pine County, Nevada; Rocky Mountain Natural Gas Pipeline Project; as well as the Harry Allen power project in Dry Lake Valley may pose constraints by reducing land availability. While on the one hand wildland resources are a constraining factor to future developments, on the other, they provide potential recreational opportunities for the people associated with those projects.

Two major federal land-managing agencies control land in the Nevada/Utah study area: the Forest Service and the Bureau of Land Mangement. Currently, Nevada and Utah have one congressionally designated wilderness area each, both administered by the USFS: the Humboldt National Forest Jarbidge Wilderness in northern Elko County, Nevada, and the Lone Peak Wilderness on the border between the Uinta and Wasatch National Forest southeast of Salt Lake City. Current recreational use figures for the Jarbidge Ranger District show a steady increase in total visitors over the last few years: from 7,300 visitor-days in 1975 to 12,300 visitor-days in 1979 (Davis, 1980). This represents a 68 percent increase in use. The trend is expected to continue through the next two decades. A profile of the users of the Jarbidge Wilderness, which makes up about 60 percent of the Jarbidge Ranger District, shows that approximately 55 percent are from Nevada (Las Vegas, Reno, and Elko) and that the remaining 45 percent are from out of state with the majority of users from California and Idaho (Wyatt, 1980). The USFS Roadless Area Review and Evaluation II (RARE II) program was designated for additional study of areas having wilderness potential and resulted in seven Nevada and 16 Utah wilderness recommendations as well as seven Nevada and six Utah "further planning" areas.

As of April 1981, total Nevada/Utah wilderness resources comprised an estimated 13 million acres, of which an approximate 2.5 million are scattered throughout the M-X study area. It is impossible to forecast how much of the estimated 13 million acres will be withdrawn from the multiple use category they now occupy and be recommended for congressional designation. If one uses the Nevada/Utah regional RARE II analysis as a model, about 19 percent of this potential wilderness acreage could become recommended wilderness. This would be an area of about 2.5 million acres. Also following the RARE II paradigm, about nine percent of the wilderness resources under review would be protected for future planning. The maximum estimate of possible future wilderness in the states of Nevada and Utah would represent an area of approximately 3.5 million acres.

Another potential change in land status that will have significant effects on the study area is the proposed Great Basin National Park. The park was originally proposed in 1959. In the fall of 1979, the Secretary of the Interior submitted a report on the study of the area for potential inclusion in the National Park System (House Document No. 96-202, Part VI). Of the four areas considered, the Snake Range/Spring Valley Study Area was selected for further study as the choice for the location of the park. The Snake Range/Spring Valley Study Area is an 811,600 acre parcel of land approximately 30 mi east of Ely, White Pine County, Nevada. Field investigations in July 1980 resulted in a draft document on specific park alternatives. The fact that the area may be declared a National Park would increase visitation to the area.

For the most part, continued operation of Great Basin significant natural areas such as wildlife refuges, National Natural Landmarks, etc. (Tables 2.2-1 and 2.2-2) with their specialized audiences, will have comparatively little impact on the study area throughout the rest of the century.

In the Texas/New Mexico study area, future use of existing state and national park and forest land is expected to increase in proportion to population growth. New Mexico has plans for opening one new state park approximately 80 mi northwest of Clovis to be named either Santa Rosa or Los Esteros State Park. Texas has no new areas within the study area proposed for acquisition. However, Caprock Canyon State Park in Briscoe County is currently scheduled for full development in the mid 1980s. No other future developments are anticipated in the Texas portion of the study area. Additional likely action are changes in status of various proposed National Natural Landmarks in New Mexico.

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